An Economic Analysis of Pro-Social Behavior

Decisions to Contribute Money and Time to Public Goods

DISSERTATION

der Wirtschaftswissenschaftlichen Fakultät

der Universität Zürich

zur Erlangung der Würde

eines Doktors der Ökonomie

vorgelegt von

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Die Wirtschaftswissenschaftliche Fakultät der Universität Zürich gestattet hierdurch die Drucklegung der vorliegenden Dissertation, ohne damit zu den darin ausgesprochenen Anschauungen Stellung zu nehmen.

Zürich, den 23. Juni 2004

Der Dekan: Prof. Dr. H. P. Wehrli

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Part B: Empirical Analysis

Preface

One of the conclusions of this thesis is that helping others makes people happy. Therefore, everyone mentioned in this preface should be happy, because they helped and supported me writing this thesis.

The thesis is based on my research undertaken at the Institute for Empirical Research in Economics at the University of Zurich. I want especially to thank my mentor Prof. Dr. Dr. h.c. mult. Bruno S. Frey for giving me an apprenticeship in economics. He supported, challenged and inspired me to analyze the world from an economic perspective while always being open to the limits of economic theory and to insights from other social sciences. The ideas presented in this thesis, which were developed in many discussions represent this broad understanding of economics. He created an atmosphere within his group from which I have greatly benefited. Many conversations with Dr. Matthias Benz, Dr. Lorenz Götte, Reto Jegen, Dr. Marcel Kucher, Simon Lüchinger and Dr. Alois Stutzer have influenced my thinking and the content of this thesis. I am particularly grateful to Matthias Benz, Lorenz Götte, Simon Lüchinger and Alois Stutzer for the care with which they read earlier drafts of this study. I wish to thank Prof. Dr. Simon Gächter, with whom I discussed the ideas presented in this thesis and who agreed to read my thesis as a co-referee.

I thank the administration of the University of Zurich for giving me access without bureaucratic red tape to a unique data set. A special thanks goes to Thomas Tschümperlin, who made the field experiment possible. I also want to thank Rosemary Brown and Dr. Misha Kavka, who helped me to improve my English skills and subsequently the English of this thesis. Sarah and Mic Frédérickx (-Milic) helped me with the English and computer crashes.

Finally and mostly, I want to thank Elisabeth Glas for supporting me throughout the whole process in every aspect. She read parts of the manuscript, helped me with the layout and was never tired to listen to the preliminary ideas and results of my research. Special thanks also to my parents, to whom this book is dedicated.

Zurich, in March 2004

Chapter I

Introduction

Shortly after Christmas 2003, an earthquake hit the region surrounding the Iranian city of Bam. The natural disaster killed more than 40,000 people and left many more with nothing but the clothes they were wearing. International aid was quick to arrive. All over the world, people donated money to help the Iranians. Governments approved large aid packages containing food, shelter tents and rescue troops. For example, the donation campaign in Switzerland was able to raise over 9 million Swiss Francs from individual donors in less than two months (in addition to aid financed through tax money).

The large amount donated to Iran from all over the world is surprising in three senses. Firstly, not only are economists probably astonished by the fact that a large number of people are willing to give money away, but standard economic theory, which relies on a narrow self-interest hypothesis, is obviously not a useful guide in explaining these anonymous donations. According to this theory, people only care about their own utility and therefore do not help others; even if people were to care about the Iranian population, individuals would free-ride on the contributions of others, with a result of close to no contributions. But, obviously, people do seem to care for others. Secondly, it is particularly surprising that money has been donated to the Iranian population. As an Islamic theocracy, reluctant to follow so-called Western values such as basic human rights and democratic rules, Iran can hardly be called a 'friend' whom one wants to support. But even the US population spent large amounts of money to support the population of their erstwhile enemy No. 1. Thirdly, additional motives for helping others have difficulty explaining the anonymous donations. It is, for example, hard to imagine that the poor people of Iran will be able to reciprocate in kind to help victims of a future earthquake in the United States.

This is just one example where individuals donate money in large sums. Economics needs to address and to explain these phenomena. The level of donations, however, is only of limited interest in the quest to understand pro-social behavior. The marginal effects are much more informative. The interesting question is therefore not whether people behave pro-socially at

all, but under what circumstances people's pro-social behavior is (marginally) more pronounced. If these conditions can be isolated, it will be possible to infer the underlying motives for contributing to a good cause. One can, for example, compare the donations by the Swiss populace to Iran with Swiss donations to victims of a landslide in the canton of Wallis in 2000. The amount of donations received to help their relatively wealthy fellow citizens was around eightfold the donations to the Iranians (74 million Swiss Francs). The large difference in donations between these very similar situations, i.e. aid to people affected by a natural disaster, can give initial interesting insights into the motivation for helping other people. There are at least three differences between the two situations. One explanation of the difference stresses that solidarity and cooperative behavior is more pronounced within a group (e.g. Swiss) than between groups (e.g. inhabitants of two nationalities). A second explanation could be the expectations of the donors that, if they were in a situation of emergency themselves, the inhabitants of the canton of Wallis would reciprocate their aid better than the Iranians. A third potential explanation focuses on the different methods for eliciting the donations: while in the case of donations to Wallis, people could phone in and offer their donations on the radio, in the case of donations to Iran no such possibility existed.[1] The offer of donations on the radio can increase the prestige people recoup from charitable giving and at the same time lead to social interaction effects. If people hear that many others are donating, they will also donate.

In order to understand the motivations for behaving pro-socially, one has to distinguish between these potential influences on the variation in pro-social behavior. However, the comparison between the donations to Iran and those to Wallis cannot be conclusive; too many variables simultaneously influence charitable giving in these cases. As long as the driving forces cannot be isolated from each other, the interpretation is ambiguous.

The aim of this thesis is to overcome such ambiguities. The reasons for donating money as well as time to a good cause will be analyzed more systematically – both in theory and empirically. In pursuing this endeavor I define pro-social behavior in a broader way: pro-social behavior includes not only donations to charities but all behavior that deviates systematically from narrow self-interest[2], one of the core tenets of economic theory. By

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[1] Personal contact with the chief of communication of 'Glückskette Schweiz', Roland Jeanneret, Feb. 2, 2004.

[2] The term self-interest is used throughout this thesis in reference to narrow material self-interest. Of course, if, say, pro-sociality provides utility to individuals, then it is in their best self-interest to behave pro-socially, in the sense that this raises their utility. However, this use does not fit most people's understanding of what self-interest means, i.e. of material self-interest as opposed to pro-social behavior.

systematic I mean that the deviations are not caused by random errors of individuals seeking to maximize their self-interest but are inherent in human preferences.

According to standard economic theory, people contribute to the public good suboptimally. This leads to gloomy predictions about human behavior; for example, as the natural environment has characteristics of a public good, people are expected to pollute extensively, while income redistribution ought to be opposed by the expected net-payers, since people should take full advantage of any situation in which they can increase their own utility – even at somebody else's expense. However, in reality such selfish behavior is observed less often than expected and in many situations people are willing to provide public goods privately. In order to analyze pro-social behavior, the empirical part of this thesis focuses on charitable giving and volunteering by individuals as one form of contributions to public goods.[3] Since we observe that in many situations individuals do not in fact maximize their narrow, material self-interest, the core question of this study is about the conditions that influence pro-social behavior. If it is possible to isolate the conditions that lead to pro-social behavior, this will increase the understanding of the motivations to contribute money and time to public goods.

To add insight to the phenomenon of individual decision-making about contributions of money and time to public goods, this thesis pursues three main goals:

(1) *To add to the understanding of the conditions under which people contribute to public goods*. Standard economic theory cannot explain pro-social behavior in a satisfying way, neither its level nor its variance. Therefore, it is necessary to enrich the narrow self-interest hypothesis with insights from other social sciences, especially social psychology. In the survey section, the theoretical approaches to pro-social behavior are presented and evaluated. The different theories vary substantially in their behavioral predictions and are often mutually exclusive. The survey, therefore, presents empirical evidence to discriminate between the theories by focusing explicitly on field evidence. It will, however, become clear that there are still many open questions about pro-social behavior.

    In the empirical part of the book, a number of these open questions will be analyzed. The empirical results add to the progress of research. Systematic behavioral reactions of people to changing conditions lead to insights about the importance of various theoretical

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[3] Much literature is devoted to understanding donations between governments (e.g. Frey and Schneider, 1986; Alesina and Dollar, 2000). It is clear that the motivation of politicians (e.g. the bureaucracy of the United States) to send rescue packages to Iran may be quite different from individuals' motivations. The same can be assumed for the philanthropic acts of corporations (e.g. Navarro, 1988).

explanations for pro-social behavior. It is, for example, found that social interaction effects are important for pro-social behavior. In contrast to predictions made by altruism models, the empirical evidence shows that people do not free-ride on the contributions of others but even increase their charitable giving when observing others do so as well.

The empirical results presented in this book have important implications for designing institutions that wish to foster pro-social behavior. These implications will be discussed and evaluated. For example, the result suggesting the importance of social interaction effects implies that individuals' behavior varies positively with the perceived group average. Avoiding an overestimation of selfish behavior in a group has policy implications, which will be differentiated and discussed.

(2) *To empirically investigate whether pro-social behavior makes people happy*. The ultimate goal of human behavior is happiness, i.e. to increase one's welfare in the broadest sense. The question about the best way to achieve happiness has dominated philosophical debate since the time of the ancient Greeks. Whether the hedonistic approach to seeking pleasure for one-self or the eudaimonic way of finding fulfillment in caring for others makes one happier, is ultimately an empirical question. The thesis investigates the relationship between utility (happiness) and pro-social behavior theoretically and empirically. Since there are only a few studies in economics dealing with this question, the discussion about whether there are happy volunteers or happy free-riders is a first step for a series of future research projects on this topic.

(3) *To analyze the variation of pro-social behavior in natural laboratories.* For decades, results from laboratory experiments have offered insights about motivations for pro-social behavior. However, it is still unclear how these results can be applied outside laboratories. This thesis aims to narrow this gap by analyzing pro-social behavior in the field. The empirical tests, therefore, represent one of the first systematic tests of a particular question outside the lab. For example, there is a relatively large discussion and a number of laboratory results available on the question whether teaching the standard model of rational choice erodes students' citizenship behavior. The evidence presented in this thesis is based on the first test systematically to analyze this question outside a laboratory setting – and the results deviate from laboratory results. The analysis of field data has, however, the disadvantage that exogenous variations of the interesting variables are relatively rare. It is therefore sometimes not possible to exclude selection effects and to make conclusive statements about causality. In the empirical part of the thesis, I avoid these shortcomings

either by creating exogenous variation in a field experiment or by analyzing the effect of an exogenous shock on a natural experiment.

In order to pursue these three goals the book is divided into two parts and eight chapters. The first part sets the theoretical stage for the empirical analysis of the second part. *Chapter II* therefore presents a survey of theories on pro-social behavior and discusses the existing empirical evidence. Since the literature on pro-social behavior contains an almost countless number of scientific contributions, the survey orders the arguments and concentrates on field evidence about pro-social behavior. At the end of this chapter, open questions will be formulated to serve as a guide to the empirical part of the thesis.

The second and empirical part of the book tests various theoretical explanations using two data sets: the decisions of all students at the University of Zurich to contribute to two social funds and the decisions of the general German population to contribute their time to provide volunteer work.

Chapter III presents the first data set. This is done in three steps. Firstly, the decision situation is presented. Secondly, a descriptive analysis of the general giving pattern offers insights about the motivation for contributing to the two funds. What turns out to be particularly important to the decision to donate is the context in which the decision is made (e.g. framing effects). And thirdly, the econometric models to be used in the following chapters are explained and applied to the results of the descriptive analysis. The three chapters that follow are all based on this data set. *Chapter IV* presents the results of a field experiment which analyzes whether students are influenced by the average behavior of the student population. Here, the relationship between individual behavior and group behavior can be tested for the first time in a field experiment. *Chapter V* analyses whether pro-social behavior responds to a change in relative prices, since for economics the functioning of the relative price effect is crucial. I will discuss the conditions under which monetary incentives can have detrimental effects for pro-social behavior. *Chapter VI* discusses whether education, and in particularly economic training, have a negative effect on pro-social behavior. It is an often-heard claim that economics education undermines citizenship behavior. This claim is here tested using behavior in a natural setting.

The empirical analysis of *Chapter VII* is based on the second data set – an established German panel data set. The question whether pro-social behavior is reflected in utility is empirically answered in looking at whether volunteers are more satisfied with their lives. The

new development in economics – happiness research – is applied to one question concerning pro-social behavior.

Chapter VIII summarizes the results of the study and points to the importance of these outcomes for economic theory and policy.

Part A

Theoretical Considerations

Chapter II

A Survey of Economic Theories on Pro-Social Behavior

1 Behavior Beyond Self-Interest

The self-interest of individuals leads to favorable outcomes for society. According to one of the most important insights in economics, the pursuit of self-interest by consumers as well as by producers is not only consistent with broader social goals, but is even required by them. This is famously stated by Adam Smith: "[i]t is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard of their own interest. We address ourselves not to their humanity, but to their self-love, and never talk to them of our necessities, but of their advantage" (Smith, 1776: 20). Thus, individuals need not consciously act to optimize social welfare; rather, the invisible hand of the market mechanism guides them.

Adam Smith, however, was also aware of the fact that the pursuit of self-interest does not always maximize the "wealth of nations" and even sometimes falls far short of reaching the socially desired outcome. When the costs and benefits of an action accrue to people other than the decision-maker, the market mechanism can break down. For example, negative external effects are incurred if the decision-maker does not bear the total costs and therefore consumes too much of the good involved. This problem occurs in the well-known "tragedy of the commons" (Hardin, 1968): people neglect the cost burden they place on others when they decide on the use of common resources. Their self-interest then leads to an overuse of the scarce resources. Conversely, in the case of positive external effects individuals do not consider the benefits for others in their decision calculus and provide too little of the good in question. In the production of art, for example, the market mechanism tends to provide a socially suboptimal amount of culture due to positive externalities (Throsby, 1994; Frey, 2000). The provision of a public good, where an equivalence between people who pay and people who use the good is lacking, illustrates the problem of the pursuit of self-interest

clearly: individuals will free-ride on the contributions of others, because they cannot be excluded from using the public good.

The provision of a (linear) pure public good (which is both non-rival and non-excludable) can be analyzed in the following way (e.g. Croson, 1998):

Each potential contributor i in the group of n identical persons has an income Y_i, which he or she can either donate to a fund F or use to consume private goods. If d_i is the contribution to the fund, the individual is privately able to consume $Y_i - d_i$. The individual's earning from the fund is a multiple m of the sum of donations from all the participants, $m\sum d_i$.[4] A public good problem exists whenever $1/n<m<1$. When $m<1$, it is never optimal for a self-interested person to contribute to the public good because the contribution costs her one unit, but gives her only m in return. When $m>1/n$, contributing to the public good is always optimal for the group as a whole, because donating one unit to the public good costs the individual one unit but earns $n*m$ for the group. For a self-interested individual, there is a unique dominant strategy in which all persons in the group *free ride* (i.e. contribute nothing). All public good situations, which are also called social dilemmas, share the same characteristic: individual, self-interested decision-making will lead to a socially suboptimal provision of the public good.

An enormous number of decision situations can be characterized as public good problems. For example, people free-ride on the efforts of others to protect the environment; no consumer puts effort into fighting for reduced tariff rates because everyone profits from the resulting lower prices; people let others organize a community event; too few people donate blood because, if needed, he or she will receive blood anyway; people do not enforce a social norm, e.g. not to litter in a public park, because they think that others should do it, etc. All these individual calculations result in suboptimal outcomes: too little environmental protection, no reduction in tariff rates, difficulties in finding somebody to organize community events, too few blood donors, and nobody who enforces social norms. In general, nobody will contribute a sufficient amount of money or time to provide a socially optimal amount of public goods. Based on the analysis that people will not contribute to public goods because it is in their self-interest to free-ride, the collective production of the public good financed by tax money can be seen as a solution to the problem. Free-riding is expected to be minimized, as everybody has to pay taxes. And yet, due to the low probability of getting caught and being penalized,

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[4] The multiple m is the marginal return for each individual when he or she contributes one unit to the fund.

paying taxes is also a public good and people will also try to evade paying taxes in order to pursue their self-interest (e.g. Alm et al., 1992).

In reality, people free-ride less often than is predicted by standard economic theory. People behave in a number of situations not according to narrow self-interest but rather pro-socially: for instance, most people actually pay their taxes, a fact that cannot be explained by relying on strict self-interest axioms (Slemrod, 1992; Andreoni et al., 1998). Tax payment can therefore be considered a "quasi-voluntary act" (Levi, 1988). Individuals do vote, although due to the low probability of having the decisive vote the expected utility of voting is close to zero and standard economic theory predicts that few people will show up at the ballot boxes (e.g. Mueller, 2003). In the political process, voters express their preferences for income redistribution in a way that goes beyond financial self-interest (Pommerehne and Schneider, 1985; Shabman and Stephenson, 1994; Bütler, 2000). Under certain circumstances people are able to prevent the overuse of a common-pool resource (Ostrom, 1990); a large part of the production of open source software is difficult to explain by relying on strict self-interested behavior (see Osterloh et al., 2003).

According to economic theory, people should take advantage of any opportunity to exploit society or another individual – but they do not. In various situations in the political sphere, in firms or in the family, people are "rent leavers", meaning that they "do not invest in something that is unproductive for others but that would increase their own income" (Bohnet and Frey, 1997: 711). Individuals therefore contribute substantial amounts of money and time to public goods. Estimations for the United States show that in 1995, more than 68 percent of households contributed to charitable organizations. In 1998, these private households donated more than 134 billion USD (Andreoni, 2002). In the same year, more than 50 percent of all adult Americans did voluntary work, amounting to 5 million full time equivalents[5] (Anheier and Salamon, 1999: 58). Although the extent of charitable contributions and the engagement in volunteer work is smaller in Europe, it is still substantial: in Europe, on average 32.1 percent of the population volunteer.[6] Taking the hours volunteered into account, this amounts to 4.5 million full time equivalent volunteers for the ten European countries taken into consideration (Anheier and Salamon, 1999: 58). The self-interest hypothesis has also been

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[5] The amount of volunteering is transformed into the equivalent of full time workers. For an even higher estimation for the United States, see Brown (1999: 25).

[6] The following countries are included: Austria, Belgium, Finland, France, Germany, Ireland, Netherlands, Sweden, Spain and UK. The data was collected in the years between 1995 and 1997. See Anheier and Salamon (1999) for details.

rejected in a large number of laboratory experiments. With respect to contributions to public goods, it has been found that people invest up to between 40 and 60 percent of their endowment in public goods (for surveys, see e.g. Ledyard, 1995; Camerer and Thaler, 1995; Camerer, 2003). In dictator games, people often voluntarily give part of the money to the recipients. However, there is a large variation, from 0 to 70 percent, of dictators who give more than nothing, depending on the conditions. For example, if people could donate part of the pie to a charity, more than 70 percent donated on average 30 percent of their endowment (Eckel and Grossman, 1996a). A recent study of experimental ultimatum games in 15 societies around the world reveals that "the canonical model of the self-interested material pay-off maximizing actor is systematically violated" (Henrich et al., 2001: 77).

The overwhelming evidence about contributions to public goods and cooperation in social dilemmas shows that the public good problem is not as severe as assumed by standard economic theory. People are in fact not solely concerned with their self-interest. As a result of these findings, a large number of theories have evolved to explain people's pro-social behavior and the variation in their respective behavior. This chapter surveys these various economic theories of pro-social behavior. In each subsection, one specific theory is investigated and predictions for behavior are derived. The hypotheses are then tested against existing empirical evidence on pro-social behavior. The empirical findings presented are mainly based on field and survey evidence rather than on laboratory experiments, but laboratory studies are also referred to where appropriate. Fehr and Schmidt (2003), Camerer (2003) and Konow (2003b) offer useful surveys of theories of fairness and reciprocity with a focus on experiments. For at least two decades, laboratory experiments have challenged the standard economic assumption. While experimental research leads to many insights about the fundamentals of human behavior, it is still unclear exactly how these results can be generalized outside the laboratory situation. This overview and the field evidence presented in the second part of the thesis aims to narrow this gap by focusing on decisions that occur in natural settings.

Why should economists be interested in a deeper understanding of pro-social behavior anyway? Why not just stick to the self-interest hypothesis, which has had great success in many areas outside of economics (e.g. Becker, 1976; Stigler, 1984; Frey, 1999; Lazear, 2000)? There are at least three reasons why it is important to understand the underlying motivation of individuals to behave pro-socially and to test the competing theories empirically:

(1) The predominant opinion in economics that self-interest is the single and most important driving force of human behavior is proven wrong by empirical investigations. Stigler

(1981: 176) was therefore wrong when he said, "Let me predict the outcome of the systematic and comprehensive testing of behavior in situations where self-interest and ethical values with wide verbal allegiance are in conflict. Much of the time, most of the time in fact, self-interest theory […] will win." The bulk of empirical evidence shows that pro-social behavior is widespread and that pro-social preferences crucially influence economic and societal outcomes. In neglecting the limits of the self-interest theory, some of the most important and most interesting aspects of human behavior are left unexplained. With theories of pro-social behavior, testable hypotheses can be derived to explain in which situations self-interest will win and in which situations people behave more pro-socially.

(2) The deviation from the self-interest hypothesis has important implications. To derive policy implications on how to foster pro-social behavior, it is indispensable to have knowledge about whether people react systematically to government interventions (see Nyborg and Rege, 2003). Governments may dampen pro-social behavior by contributing to public goods, which might crowd out private contributions; governments may also offer (external) incentives to behave pro-socially, like tax reductions; or they may regulate behavior. Ultimately, in order to design effective institutions, one has to know the conditions under which people are most likely to behave pro-socially. But politicians' incentives in designing such institutions also have to be taken into account. Politicians may not be interested in designing efficient institutions if it hurts their clientele. The fact that even politicians may behave pro-socially is, however, very much disregarded in the literature on "public choice".

(3) The research on the economics of pro-social behavior can provide information about methods to elicit voluntary contributions (Steinberg, 1991a; Andreoni, 1998). The majority of charitable organizations depend on private contributions of time and money. But it has to be conceded that, overall, fundraising agencies are probably already intuitively using the right methods to maximize donations. However, theories about pro-social behavior help to better understand the functioning of the charitable sector in general.

The survey proceeds as follows: Section 2 presents explanations for contributions to public goods which are still based on strict self-interest. These 'sophisticated' self-interest theories, however, can only partly explain pro-social behavior such as charitable donations and volunteering. Section 3 presents the three most important sets of theories on non-selfish or

'other-regarding' behavior: theories based on pro-social preferences, theories based on the norm of reciprocity and approaches that focus on institutional environments. Section 4 presents evidence for the effect of relative prices on pro-social behavior. Section 5 discusses the heterogeneity of individuals with respect to pro-social behavior and the importance of such differences for an economic analysis of pro-social behavior. In section 6, the relationship between utility and pro-social behavior is discussed. Section 7 draws conclusions for policy and formulates remaining open questions.

2 Theories Based on 'Extended' Self-Interest

To explain contributions of money and time to public goods, various theories have been presented which are based on self-interest or use an extended version of the self-interest hypothesis. [7] The two most prominent branches of theories posit either that: (1) the contribution to a public good simultaneously allows the consumption of a private good (for example, people benefit from selective access to some goods, gain prestige or are able to signal their wealth) or that (2) incomplete information about the number of repetitions or about the rationality of the other individuals makes contribution the dominant strategy.

2.1 Selective Incentives

In a seminal paper on collective action, Olson (1965) emphasized that people may contribute to a public good if it is a precondition of receiving a private good. In the political sphere, contributions to an interest group or donations to a political party may be motivated by the expectation of receiving a private good. Automobile lobby groups like the AAA, for example, provide breakdown services, insurances and reductions in hotel prices to their members. Donors of arts organizations may gain access to special events, gala dinners, or choice seats in the opera house they support; they may even have exhibition halls named after them. In addition to the aforementioned fringe benefits, volunteers may receive job experience and a social network. Especially for at-home mothers, volunteering can be seen as an investment in human capital and may be used as a re-entry strategy into full employment (Schram and Dunsing, 1981). People contribute, according to this reasoning, to public goods in order to receive a fringe benefit which they otherwise could not get on the market.

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[7] This survey does not deal with the argument that people contribute to public goods out of confusion because the respective academic discussion relates mostly to laboratory research (e.g. Houser and Kurzban, 2002). It seems absurd to talk of confused individuals when looking at pro-social behavior in real-life situations.

Similarly, contributions to public goods, e.g. donations to a charitable organization, can increase the social standing of a donor (Harbaugh, 1998a) or the donations can signal one's own wealth (1996). Especially if geographical distance does not allow signaling one's financial success with other positional goods like yachts or cars, publicized charitable contributions may serve such a purpose. Despite the fact that prestige is not a material good, the important aspect of the 'prestige motive' is that people instrumentally behave pro-socially to get an external reward.

Based on these arguments, the following predictions for individual behavior can be derived:

> *SELECTIVE INCENTIVE HYPOTHESIS: If the provision of a private good is responsible for contributions to a public good, i) people will only contribute if selective incentives are offered and ii) they will contribute the minimum amount required to receive the private good.*

Some empirical studies have explicitly tested whether fringe benefits are an important motive for pro-social behavior. Olson (1965) presents circumstantial evidence that the provision of non-collective goods plays a substantial role in labor unions and farmer associations. A more detailed analysis is provided by Buraschi and Cornelli (2002), who try to isolate the effect of the provision of fringe benefits using a donor database of the English National Opera, which keeps track of their donors' donations *and* their consumption of performances and their attendance at special events. The authors find that those people who pay the minimum amount for membership tend to go to special events organized by the opera like dress rehearsals. The authors therefore conclude that access to fringe benefits is an important motivation for becoming a donor. The study, however, has severe shortcomings. Large donations, in particular, cannot be explained by the fringe benefit argument. Furthermore, causality is unclear because only donors can attend special events. It is therefore not surprising that attendance at special events explains 'being a donor'.

The hypothesis that donations may be driven by a desire to signal wealth in order to increase one's prestige is partly supported in studies by Glazer and Konrad (1996) and Harbaugh (1998b). The authors analyze alumni giving to US universities. They have found that people choose to donate an amount just slightly greater than that needed to appear in a certain donations bracket, as publicized in the alumni journal (e.g. donation of $500-1000). This evidence could support the notion that alumni donate strategically in order to appear in the next higher donations group. An alternative explanation, however, would stress that the donation brackets

may just constitute focal points and therefore donations are grouped just above the lower boundaries of the brackets. Further studies could usefully investigate this issue, including how much the prestige motive is based on social comparison. Probably, the prestige motive has much to do with the donation amount relative to other people.

The aforementioned evidence supports the hypothesis that fringe benefits and prestige are one motivation for pro-social behavior. Many charities use fundraising techniques which take this motive into account. For instance, they organize dinners where social comparison between potential donors is used as a method to increase donations. However, the theory can only partly explain pro-social behavior. Empirically, the provision of selective incentives can only explain 'voluntary' contributions of money and time to public goods in isolated instances. In many situations, however, people donate money without the expectation of receiving a private good. Numerous decisions to contribute are taken anonymously and therefore the provision of fringe benefits is excluded a priori. For example, if nobody knows about a person's pro-social behavior, recognition in the form of increased prestige cannot be gained externally. In such situations, there is no possibility of receiving a private good or recognition from others as an external (material) reward for pro-social behavior.

2.2 Incomplete Information

According to standard game theory, it is rational for self-interested subjects to cooperate in infinitely repeated public goods games. To cope with the fact that people also cooperate to a certain extent in finitely repeated public goods games, game theorists were obliged to rethink their models. The introduction of two kinds of incomplete information into repeated games changes the prediction that people do not cooperate in such situations. Firstly, if the end point of a repeated interaction is stochastically determined, subjects with low discount rates may reach optimal or near optimal outcomes (Fudenberg and Maskin, 1986). Secondly, if individuals are uncertain whether one subject 'irrationally' reciprocates cooperation with cooperation, purely selfish actors may choose to cooperate in early stages and defect in later rounds (Kreps et al., 1982). These theories, however, are unable to explain cooperation in one-shot social interactions and cooperation in last rounds.[8]

The theories based on 'extended' self-interest cannot explain the full range of pro-social behavior. Even in anonymous situations where no material fringe benefit can be expected,

[8] Ostrom (1998) discusses the introduction of incomplete information into repeated games more fully.

people often behave pro-socially. Although some economists are reluctant to accept that the self-interest hypothesis has its limits, the bulk of empirical evidence on pro-social behavior requires that theories explaining human behavior go beyond self-interest.

3 Theories Beyond Self-Interest

Adam Smith, who praised the selfishness of individuals in *The Wealth of Nations*, did not believe that only selfish motives matter for human beings. In his first book on *The Theory of Moral Sentiments*, Smith wrote that "How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it" (Smith, 1759: 3). In recent years, various models have been developed in order to map out *how* man is interested in the fortune of others and whether these motives can systematically explain pro-social behavior. Three groups of prominent models can be broadly distinguished: (1) theories based on *pro-social preferences* assume that an individual's utility depends directly on the utility of other people; (2) theories of *reciprocity* are based on the notion that individuals behave in a friendly manner when they are treated benevolently and, conversely, they act meanly when treated badly; and (3) a third group of approaches stresses the importance of the *institutional environment* for pro-social behavior.

The first two theoretical approaches focus more narrowly on motivational factors for pro-social behavior. For example, researchers consider whether people share some of their possessions because they are motivated by altruism. The third approach focuses more on the institutional environment, which on the one hand influences the importance of the two former motivations, but on the other hand also points to motivations which go beyond pro-social preferences and reciprocity. The definition of property rights, for example, is important. People's willingness to share their possessions decreases substantially if they have earned the money they share, compared to a setting where they find the money on the street or where they get it as a gift.

Importantly, all motives for pro-social behavior presented in the following sections depend on something other than external reward. People behave pro-socially because they get an internal reward. Individuals have an 'intrinsic motivation' (Deci, 1975; Frey, 1997a) to undertake a certain task, e.g. to volunteer, to pay taxes, to vote, or to donate money to a good cause.

Each theory predicts different behavioral patterns of individuals. The most pronounced behavioral hypothesis can be made about how people react to the behavior of others. A special focus of this survey will therefore be placed on how a person motivated either by altruism or by reciprocity reacts to the behavior of other (public or private) actors. The hypotheses derived from such an approach are then balanced against the existing empirical evidence. In the second part of the thesis (chapter III to VII) my own empirical results will be presented to shed light on pro-social motivations.

3.1 Pro-Social Preferences

Theories of pro-social preferences are based on the notion that people's utility functions are interdependent. Individuals care not only about their self-interest but also take the well-being of others into account. In the three most prominent formulations of pro-social preferences, the utility of others can either (1) influence one's utility directly (pure altruism theories), (2) influence one's utility partly because helping others produces a 'warm glow' (impure altruism theories) or (3) have an effect on one's utility that depends on the difference between one's own and another's well-being (theories of inequality aversion).

3.1.1 Pure Altruism

Altruism theories assume that others' consumption or utility positively affects an individual's own utility (e.g. Becker, 1974; Collard, 1978). People contribute to a public good because they enjoy the well-being of others. Altruistic preferences are used to explain a wide range of pro-social behavior: donations (Smith et al., 1995), volunteering (Unger, 1991), behavior in the workplace (Rotemberg, 1994), and contributions in laboratory experiments like dictator games (Andreoni and Miller, 2002; Eckel and Grossman, 1996a). Pure altruists do not care about the source of others' well-being. If, for example, the utility of a welfare recipient increases, the altruist's utility will increase as well, independent of who actually improved the situation of the welfare recipient.

Altruism theories assume that individuals enjoy seeing the well-being of others increase independently of the source of the improvement. This leads to the most important prediction offered by altruism models about the reaction of altruistic individuals to the contribution of others (see e.g. Roberts, 1984):

ALTRUISM HYPOTHESIS: People will contribute positive amounts to public goods but their contributions are inversely related to the contributions of others. If other private individuals or the state contribute to the public good, people will reduce their contribution to the same extent.

The prediction of altruism theories that contributions by others will crowd out an individual's own contribution completely has been criticized on the basis of both theoretical considerations and empirical facts. From a theoretical point of view, for example, it can be argued that in large groups, no altruist would contribute to a public good due to the fact that he or she would free-ride on the contributions of others (Andreoni, 1988; Sugden, 1982). But in reality, people donate to large charities like the Red Cross or Amnesty International. In empirical research, it is difficult to support the one-to-one crowding-out of private contributions by public grants. Government spending has been found to crowd out private contributions, but the crowding-out is far from complete (dollar-for-dollar); it lies in the range of zero to one-half. Ribar and Wilhelm (2002), for instance, find in their analysis of donations to relief organizations that the crowding-out ratio is very small.[9] A one-dollar increase of governmental grants reduces private contributions by at most only 23 cents. Similar results can be found for contributions to other public goods like radio broadcasters (Kingma, 1989).[10] In the laboratory, the crowding-out effect can be quite sizeable (e.g. Andreoni, 1993; Bolton and Katok, 1998). The differences between field and lab evidence can be either due to differences in group size (Ribar and Wilhelm, 2002) or to the fact that government spending in the field might increase 'moral suasion' by signaling a greater social concern for a public good. In the laboratory, such complementary effects of others' contributions have been found to be absent (Bolton and Katok, 1998). There is, however, an alternative explanation for the results mentioned. Government grants may not only crowd out private contributions due to donors' altruistic preferences, but they may also lower the incentive of charities to undertake fundraising activities. If managers of charities see fundraising as a burden, the flow of government grants may reduce their effort to raise donations.[11] Andreoni and Payne (2003) have empirically established that, for arts organizations and social service organizations, part of the

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[9] Their analysis is especially valuable as it introduces controls for unobserved institution-specific factors, year-to-year changes in need and changes in organization leadership, factors which may potentially have biased the results of previous studies.

[10] See also the results in Okten and Weisbrod (2000), Khanna and Sandler (2000), Payne (1998) and Steinberg (1991b).

[11] Fundraising and revenues from ancillary goods constitute a 'necessary evil' for many managers of non-profit organizations (see e.g. Segal and Weisbrod, 1998).

crowding-out indeed comes from the reduction of charities' fundraising efforts when they receive government grants. If fundraising efforts are not included in the estimations, even a low crowding-out effect is likely to be overestimated.

3.1.2 Impure Altruism

Because pure altruism theories do not make empirically accurate predictions with respect to crowding-out effects, Andreoni (1989; 1990) extends the altruism model with a 'warm glow' motive for giving. People care not only about the utility of the recipient but receive some private goods benefit from their pro-social behavior *per se*. In comparison with the private goods benefit mentioned in section 2 (e.g. prestige), the 'warm glow' is purely internal, derived from the donor's own knowledge of his pro-social behavior. Psychologically, various underlying motivations may cause the ultimately egoistic 'warm glow', such as self-reward, negative state relief or guilt reduction (for a survey, see Bierhoff, 2002). In the case of volunteering, self-determination and increased self-esteem may be intrinsically rewarding motives.[12] In models of impure altruism, crowding-out is never perfect because donors still receive a benefit from the donation per se. The prediction of the impure altruism model better fits the observation that givers do not see grants as perfect substitutes for private contributions.[13] Nevertheless, the model of 'warm glow' giving still predicts that people will partly reduce their own contributions when other agents or the government increases their share to the public good.

Theories of altruism assume stable interdependent preferences. According to these theories, people will therefore exhibit stable behavior in favor of others. However, this prediction is at odds with at least two empirical observations. Firstly, pro-social behavior erodes with repetition in most experimental studies (e.g. Dawes and Thaler, 1988). Although in field studies this erosion may be less pronounced, as we will see in the empirical part of the thesis, altruism theories are not able to explain the decay of pro-social behavior. Secondly, people do not always behave pro-socially to increase the well-being of others. Sometimes they consciously reduce others' utility by punishing their behavior, which is inconsistent with

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[12] See chapter VII on volunteering and well-being for further details.

[13] Another extension of the pure altruism model assumes that donors value making a difference (Duncan, 2003). In contrast to the impure altruist, the 'impact philanthropist' not only cares about the amount of money he donated, but also whether his donation has a significant impact. The model therefore does not predict a dollar-for-dollar crowd-out as predicted by the pure altruism model. Moreover, it suggests that others' contribution do crowd out giving more than in the impure altruism model, because "(…) an impact philanthropist cannot enjoy saving children if other philanthropists save them first" (p. 2).

altruistic preferences (Fehr and Gächter, 2000a). To cope with these behavioral irregularities, models of inequality aversion focus on the relative well-being of subjects.

3.1.3 Inequality Aversion

Models of *inequality aversion* assume that one's relative standing in the income distribution is important. According to the model of Fehr and Schmidt (1999), people do not like inequality.[14] Inequality is particularly disturbing when a subject's payoff is smaller than that of other subjects. Such models attempt to explain why, on the one hand, people behave altruistically towards others worse off than they are while on the other hand they punish those who are better off then they are.[15] A number of studies in experimental economics have investigated this phenomenon and found that people's behavior in various situations can indeed be explained by inequality aversion (Fehr and Schmidt, 1999). However, people are also driven by other motives than to reduce inequality. Charness and Rabin (2002), for example, let subjects in a number of simple games choose between an equal payoff (e.g. 400, 400) and an unequal but often more efficient payoff (750 for the recipient and 400 for the dictator). The authors find "a strong degree of respect for social efficiency, tempered by concern for those well off" (p. 849), i.e. the more unequal but socially efficient outcome is often chosen. Whether people are more concerned with social welfare than with inequality has to be investigated further, possibly using a broader set of games than simple dictator games.

The following theories extend these models by assuming that people care about the well-being of others conditionally on their behavior and *intentions*.

3.2 Reciprocity and Social Comparison

The aforementioned theories of pro-social preferences assume that people value only the distributional consequences of their own and others' behavior. In theories of reciprocity, people are also concerned about the intentions that lead other people to behavioral choices. We talk of reciprocity when individuals act in a more cooperative manner in response to the friendly behavior of others and in a hostile way in response to unfriendly behavior (Rabin, 1993; Sugden, 1984; Falk and Fischbacher, 2001). The reciprocity model has recently gained much attention. It has been claimed that "[p]ractically all life in society includes and implies reciprocities, and reciprocity has been seen as the basic glue that makes people constitute

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[14] For a similar model, see Bolton and Ockenfels (2000).
[15] For models which introduce other motives like envy and spitefulness, see Fehr and Schmidt (2003).

groups or societies" (Kolm, 2000: 115). A substantial number of studies in experimental economics (e.g. Fehr and Gächter, 2000b) supplement the evidence provided by other social sciences indicating that reciprocity is an important factor in pro-social behavior (for sociology, see e.g. Gouldner, 1960; and for anthropology, see e.g. Sahlins, 1970). In public good games, the option for reciprocally punishing free-riders sustains high contribution rates even with repetition (Fehr and Gächter, 2000a). This is not trivial, as contributions in public good games normally converge to full free-riding over time (Dawes and Thaler, 1988; Ledyard, 1995). Individuals do indeed undertake the costly punishment of free-riders. The more a subject's contribution is below the average of group contributions, the more heavily he or she is punished (Fehr and Gächter, 2000a).

There is also evidence for reciprocity and its influence on pro-social behavior outside the laboratory. Fong (2001) interprets survey data about support for redistribution as evidence for the importance of reciprocity. People who believe that the needy are necessary those who have been beset by unfortunate external circumstances are more in favor of redistribution. In contrast, people who believe that the poor are not doing their share to escape poverty are more likely to be against redistribution (see also Bowles et al., 2001). This reflects the view that if the poor don't give or try to give their share to society, they should not receive aid. However, it is also possible that people who are selfish in general will legitimize their behavior by assuming that welfare recipients are able but unwilling to help themselves. In a second study, Fong (2003) addresses this caveat by randomly matching welfare recipients who report different work morals to potential donors. The results show that people who indicate in a pre-experiment survey that helping the poor is important are especially sensitive to the laziness of welfare recipients. On the one hand, they give large amounts to people who have a high work ethic, while on the other hand they reduce their share substantially when confronted with a lazy person. People who do not indicate in the pre-experiment survey that helping the poor is important are significantly less sensitive to a recipients' laziness.

The principle of reciprocity seems to be important in various fields, from merchandising to political 'logrolling' (a number of examples can be found in Cialdini, 1993), tax compliance (Smith, 1992), tipping in restaurants (Conlin et al., 2003; Seligman et al., 1985) and effort in the workplace (e.g. Akerlof, 1982; Frey, 1993; Fehr et al., 1997). To test the effects of reciprocal norms in charitable giving, Falk (2003) conducted a large-scale field experiment where potential donors were provided with either no gift, a small gift or a large gift in the solicitation letter. The relative frequency of donations increases by 75 percent amongst those

receiving a large gift, compared to the 'no gift'-treatment. If a person receives a gift from a potential aid recipient, the norm of reciprocity seems to require returning a donation. For interactions between donors and recipients, the principle of reciprocity thus seems to play a substantial role. Other studies, however, question the importance of reciprocity for particular forms of pro-social behavior. Bohnet and Frey (1999a) and Johannesson and Persson (2000) could not support the findings of a previous study by Hoffman et al. (1996) that indicated reciprocity leads to positive contributions in a dictator game. [16] Their studies do not allow for any reciprocity in the experimental setting, but still find substantial positive amounts of giving. Undoubtedly, more research is needed to analyze the conditions under which reciprocity is most important. For the norm of reciprocity, it may be a question not only of the relationship between the donor and a single recipient, but also whether reciprocity affects social interactions *between* donors.

One implication of theories of reciprocity is that people react positively to the behavior of others. When a group of people has to decide whether to contribute to a public good, individuals will judge the behavior of others as kind or not, and adjust their behavior accordingly. If individuals observe that others behave pro-socially, they will do so as well. No one likes being the only one who contributes to a good cause, and no one likes being the 'sucker' who is 'being free ridden' by others. The most distinctive prediction to such a theory is that individual *i*'s probability of contributing to a public good *increases* when the percentage of individuals *j* (j=1, …, n; j≠i) who contribute increases within a given group. The prediction stands in contrast to the prediction made by altruism theories, where a negative relationship between an individual's own behavior and the contributions of others in his group is expected.

> *CONDITIONAL COOPERATION HYPOTHESIS: People's pro-social behavior is conditional on the behavior of others. The individual behavior varies positively with the average behavior in the group.*

The idea of *conditionality* in theories of reciprocity is crucial. Individuals are defined as conditional cooperators when the positive correlation discussed above applies. This theoretical prediction is based on a broad notion of social comparison. The idea that the more others contribute, the more one gives, may be based on three motivational reasons. Firstly, people have some sort of reciprocal preferences, as mentioned above. Secondly, people may want to behave in an appropriate way and to conform to a social norm. The behavior of others

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[16] See also, Bolton et al. (1998) and Bolton et al. (2000).

signals what one 'should' do, and people wish not to deviate from the social norm (see e.g. Cialdini and Goldstein, 2004; Messick, 1999). Or thirdly, contributions by others may serve as a signal for the quality of the public good, or of the organization which provides the good in the end (e.g. a charity, see Vesterlund, 2003; Andreoni, 2004; Romano and Yildirim, 2001). The few studies which try to ascertain in a laboratory setting whether people undertake social comparison out of conformity or reciprocity mostly conclude that their results cannot be explained by reciprocity, but rather by conformity or signaling (Schroeder et al., 1983; Bohnet and Zeckhauser, 2002; Bardsley and Sausgruber, 2002; Potters et al., 2004). However, Falk et al. (2003) let their subjects play two separate public good games simultaneously. The authors find two social interaction effects: firstly, people give more to the group with high cooperation rates and, secondly, the contribution within one group depends positively on others' contributions. The behavior in this experimental setting cannot be explained by conformity, but indicates that people reciprocally contribute more to the group when cooperation by others is more pronounced.

There are two ways of testing reciprocity and in particular 'conditional cooperation':

(1) Expectations about the behavior of others should positively correlate with one's own behavior, as found in various studies (e.g., see Selten and Ockenfels, 1998; Croson, 1998; Dawes et al., 1977). For example, there is a large literature showing that people's (self-reported) tax compliance correlates with their estimate of other people's non-compliance (e.g. Bosco and Mittone, 1997; Kaplan and Reckers, 1985; Webley et al., 1988). However, this kind of evidence does not reveal the direction of causality. It may be the case that expectations do not trigger behavior, but rather that behavior influences expectations. Such a 'false consensus' effect (Ross et al., 1977; Dawes et al., 1977; Marks and Miller, 1987) can occur because one projects one's own behavior onto others, or because behavior needs to be justified.

(2) In a laboratory experiment, which allows one to vary the average behavior of the group at random, Fischbacher et al. (2001) solved the causality problem by using the strategy method. Subjects in their laboratory public good game have to decide how much to give to a public account, on the basis of the contributions of others. The study concludes that roughly 50 percent of the people increase their contribution if the others do so as well.[17] Importantly, Fischbacher et al. argue that conditional cooperation explains the decrease of

[17] This result is replicated in Houser and Kurzban (2003).

contributions with repetition, which can be observed in almost all repeated fairness experiments (e.g. Dawes and Thaler, 1988). People observe the behavior of others and give slightly less. Such an incomplete matching of others' contributions will lead to an erosion of pro-social behavior over time. However, in many real-life situations like participation in elections and paying taxes, no such erosion is observed, although exact feedback of the participation rate, at least for voting, is available. There are of course a number of situations where public goods are not provided. It seems that much more has to be known about situations in which conditional cooperation will lead to an erosion of pro-social behavior and vice versa. This point is discussed further in the empirical analysis in chapter IV.

A number of other public good experiments do not test the effects of social comparison explicitly, but the results show that individual contributions vary with the mean contribution of the group (e.g. Keser and van Winden, 2000; Offerman et al., 1996; Kurzban et al., 2001; Croson, 1998; Brandts and Schram, 2001; Albert et al., 2002; Tyran, 2004; Tyran and Feld, 2002; Andreoni and Samuelson, 2003). In contrast to most studies about conditional cooperation, which are based on laboratory experiments, Andreoni and Scholz (1998) provide a non-laboratory study, finding that one's own donation depends on the donations of one's reference group. The results show that, if the contribution of those in one's social reference group increases by an average of 10%, the expected rise in one's own contribution is about 2% to 3%. However, because the reference group in this study is constructed on socio-economic characteristics, it does not provide a direct test of how people react to the behavior of others.[18]

In a very interesting field experiment on tax compliance, Wenzel (2001) asked taxpayers in a first step about their own tax compliance and about others' norms and behavior with regard to paying taxes. In the field experiment, he informed a subgroup of these taxpayers about their misperception of others' behavior. Taxpayers, actually, wrongly think that most others act less honestly than they themselves do. When people are informed in the experiment that others are more honest than they expected them to be, they subsequently significantly reduced their claims for tax reductions (in their actual behavior) compared to the control group. This result can be interpreted as evidence that people behave conditionally on what others do.[19]

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[18] See also the studies on social interaction effects in general. Individual behavior has been found to vary with group behavior, as, for instance, with for criminal activities (Glaeser et al., 1996) and in the case of welfare participation (Bertrand et al., 2000).

[19] See also the field experiment by Blumenthal et al. (2001). However, they find no statistically significant effect to informing taxpayers that few others cheat.

Another field experiment that can be interpreted as evidence for 'conditional cooperation' is presented by List and Lucking-Reiley (2002). The authors analyze the impact of 'seed money' on charitable donations. 'Seed money' denotes the share of a public good already collected when looking for additional donors. When the authors exogenously increased the 'seed money' (which can be interpreted as the donations by others) from 10 to 67 percent, donations increased by a factor of six, with an effect on both participation rates and contribution levels. This result may also be interpreted as a positive correlation between the giving of others and the giving of the individual donor. A positive correlation has also been found in a situation where money is collected in a community using a list of others in the neighborhood who had already donated. The longer the list, the higher the willingness to contribute (see e.g. Reingen, 1982).

In sum, there are a number of studies analyzing the influence of a norm for reciprocity on pro-social behavior. Field studies are, however, very rare. In chapter VII, an empirical study is presented which tests for conditional cooperation in a naturally occurring decision situation.

3.3 Institutional Environment

For pro-social behavior, the institutional environment in which people decide to contribute time and money to public goods is crucial (e.g. Ostrom, 2000; Sobel, 2002: 146-149). The institutional environment can be defined as "the set of fundamental political, social and legal ground rules that establish the basis for production, exchange and distribution" (Davis and North, 1971: 71). The institutional environment, which constitutes the context in which people decide, can matter even though the decisions remain the same in terms of material pay-offs. Such context-dependent pro-social behavior has been labeled 'institutional framing' by Isaac et al. (1991).

The influence of the institutional environment on pro-social behavior can be twofold. On the one hand, the context calibrates the salience of motives like altruism and reciprocity. In a situation where a mechanism exists to punish free-riders, the norm of reciprocity will be more important than in the absence of this institutional feature. On the other hand, the institutional environment can trigger motives which go beyond altruism and reciprocity, as evidence presented by Bohnet and Frey (1999a; 1999b) and Frey and Bohnet (1995) suggests. In a dictator game they allow for one-way identification, meaning that the dictator sees the recipient but not vice versa. This institutional change increases the willingness to cooperate dramatically. Such a shift in behavior can be explained neither by altruism nor by reciprocity,

because according to these theories identification should not change the behavior in the decision situation. Giving in dictator games may therefore not solely be caused by reciprocity (e.g. Hoffman et al., 1996) or altruism (e.g. Johannesson and Persson, 2000).

The effect of contextual factors on pro-social behavior is supported in various experiments, where framing the same decision differently has a critical influence on decisions (see e.g. Andreoni, 1992; Sonnemans et al., 1998; Elliott et al., 1998; Cookson, 2000). Even the labeling of the same prisoner's dilemma game as either a 'community game' or a 'wall street game' changes behavior significantly. Whether cooperation in the 'community game' is higher due to a change in the salience of the social norm or in the expectations about other people's reactions, however, is an open question (see Bohnet and Cooter, 2003). Because framing effects are significant, most experimentalists try to avoid using verbal cues in their decision settings. However, verbal framing is not the only contextual factor which influences human pro-social behavior. Real-life social contexts contain a variety of cues which shape individuals' beliefs about the appropriate set of rules. This is closely related to findings in ultimatum game experiments conducted in 15 cultures: "[...] the preferences over economic choices [...] are shaped by the economic and social interactions of everyday life" (Henrich et al., 2001: 77). The institutional environment can have at least two distinctive effects:

(1) *The institutional environment changes the salience of a social norm*. Institutional settings as well as framing effects change the focus of what is considered to be fair behavior in a certain situation. The context helps to evaluate which set of values to use. Whether people share $10 that they have received as a gift or, by contrast, that they have had to earn does indeed influence the 'generosity' of the donor considerably. In dictator games between students, an equal split of the total seems to be the norm for donors. When the same amount of money has to be shared with a charity, the amount given is on average much larger (Eckel and Grossman, 1996a). People behave like 'conditional altruists' (Konow, 2003a) whose pro-social behavior is dependent on the setting. According to Bohnet and Frey (1999b), the contextual setting influences the social distance and thereby varies the empathy between the actors. Charities have long recognized the importance of reducing social distance between donor and recipient. One often-used technique to trigger empathy is to allow for sponsor-specific recipients. It is well known that people are more willing to help an 'identifiable victim' (Schelling, 1968), like a specific child in the Third World,

than to support a project which tries to improve the overall situation of children in poor countries.[20]

More generally, contextual factors not only change the social distance between the individuals, but also influence the salience of a social norm in contributing to a public good. It can be hypothesized that "(…) the greater the extent to which a decision is taken in a social context, the more relevant manners become" (Bohnet and Frey, 1999b: 44).

(2) *The institutional environment varies the degree of (potential) social sanctions*. The context in which people decide to contribute to a public good affects the extent of social sanctions when the social norm is violated. Even in anonymous situations, people may follow the internalized social norm because they otherwise suffer from guilt, shame or fear (Coleman, 1990). According to Trivers (1971), internalized norms are a reaction to social sanctions in case of the violation of a norm. Even the suspicion that someone dislikes one's behavior can trigger compliance (see Brennan and Pettit, 1993; Loewenstein, 2000). Social sanction, e.g. in the form of social approval or disapproval, is most important if each person's identity is revealed. In situations where anonymity is lifted, pro-social behavior is expected to be the most pronounced (Rege and Telle, 2004). Soetevent (2003) examines the role of anonymity in a field experiment in Dutch churches. Either 'closed' collection bags or open collection baskets were randomly used for the collection of offerings. The open baskets, where the neighbors on each side can identify the donor's contribution, increase contribution in the services' second offering by 10 percent. Interestingly, people started to give larger coins when open baskets were used.

To illustrate the importance of the institutional environment, three different phenomena will be discussed which substantially influence pro-social behavior: (1) property rights; (2) in-group effects; and (3) communication.

(1) *Property rights*. The perception of what constitutes a fair allocation is shaped greatly by the way property rights are assigned (see Frey and Bohnet, 1995; Gächter and Riedl, 2003). Imagine the following situation with two different environments: you submit an academic paper for a prize, as does your colleague. In one setting, the independent jury chooses your paper to receive a $1000 prize. In the other setting, the independent jury could not choose between your paper and your friend's paper, but a lottery was used to

[20] For studies on the 'identifiable victim effect', see Jenni and Loewenstein (1997) and Small and Loewenstein (2003).

determine that you will receive the cash prize. Would you share the money prize with your friend? Probably only in the situation where you received the property rights by luck. The way of assigning the property right changes the principles of what is perceived as a fair share. Cherry et al. (2002) investigated whether in a laboratory dictator game the allocation differed when earned wealth was divided compared to unearned wealth given by the experimenter. In the treatment where people received the money as a gift, only 15 percent offered nothing to the recipients. In sharp contrast, when people had to earn the $40 which was to be divided by answering some questions, 70 percent of the subjects offered nothing to the other person. It seems that less generosity can be expected when people attribute the received property rights to a variable that they can influence (e.g. effort). In contrast, when the assignment of a property is based on factors that cannot be influenced (e.g. luck), an equal sharing is perceived to be fairer (Konow, 2000; Hoffman and Spitzer, 1985). One should expect that the stronger the property rights that are assigned, the less likely individuals will be to share their wealth equally.

(2) *In-group effects*. The institutional environment may shape the formation and salience of groups. For example, whether individuals are faced with a decision to behave pro-socially in their own firm or in the supermarket is critical for their decision (see e.g. Carpenter et al., 2003). There is overwhelming evidence suggesting that people tend to cooperate more with their in-group (e.g. other members of the same fraternity) than with individuals not part of their in-group (like members of other fraternities) (see e.g. Kollock, 1998). Even a minimal definition of groups (e.g. those who prefer Kandinsky over Klee) has been found sufficient to create a group identification that has a significant influence on the division of money in an experimental setting (e.g. Tajfel, 1981). In-group effects can also been found outside the laboratory. The more equal and less fragmented a community is in terms of ethnicity and race, the greater is the willingness to participate in social organizations and activities (e.g. Alesina and La Ferrara, 2000), and the greater is the acceptance of income redistribution (e.g. Luttmer, 2001). One reason for the higher contribution rates in in-groups may be that in a defined group, individuals have a biased perception about members of their own group and those of the out-group. In the case of redistribution, people may attribute the poverty of a group member to external circumstances (such as bad luck), whereas a poor outcome for a non-group member tends to be attributed to poor

personal characteristics.[21] The tendency to help in-group members may also be due to various other reasons, like reciprocity, social pressure or sociobiological motives.

(3) *Communication*. A number of studies have empirically shown that communication is important for cooperation in social dilemmas (for a meta-analysis, see Sally, 1995), despite the fact that no enforceable agreements can be made and communication is therefore viewed as 'cheap talk' (Farrel and Rabin, 1996). Communication fulfills two important functions.[22] Firstly, people get to know the other people involved; after just a few minutes of talking, the subjects' expectation of others' cooperative behavior increases significantly in accuracy (Frank et al., 1993b). If people believe that the other group members will not free-ride, their willingness to contribute increases (according to the hypothesis about 'conditional cooperation' discussed in the last section). Communication, however, has to be face-to-face to affect the judgment of others; when communication is only allowed via a computer, the effects on cooperation are smaller (Ostrom, 2000). Secondly, communication obviously provides an opportunity for subjects to ask other individuals whether they want to contribute to a public good. Most subjects in experiments where communication is allowed try to make agreements about mutual behavior (Frey and Bohnet, 1995). Even though such agreements can never be enforced, people seldom violate them. People seem to feel obliged to stick to their promises, because the inconsistency of breaking a promise has high psychic costs.[23] 'The Importance of Being Asked' can be demonstrated for the decision to volunteer (Freeman, 1997), to donate money (Long, 1976), to participate in political demonstrations (Opp, 2001) and even for the rescue of Jews in World War II (Varese and Yaish, 2000). The importance of being asked is not only due to selection (people who look like potential volunteers are asked). The requests carry some 'social pressure' with it, and therefore people are more likely to be persuaded by a personal request than by written requests; the

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[21] A number of studies in psychology analyze how in-group effects can influence the perception of the out-group. Open hostility towards people of the out-group may be the most negative effects of in-group favoritism. For a survey of such intergroup biases, see Hewstone et al. (2002).

[22] Communication can also lead to a better understanding of the dilemma structure. The effect of this understanding is ambiguous and is discussed e.g. in Bohnet (1997).

[23] A large Swiss charity, for example, raises donations by announcing the donated amount on public radio. The reasons for this technique may be twofold: firstly, people are more willing to donate when others do so as well ('conditional cooperation') and, secondly, it may be easier to express the intention to donate than to actually do it. Surprisingly (for an economist), most people actually donate the promised amount although no enforcement mechanism exists. Cialdini (1993: 57-113) presents many examples of how firms use people's tendency to be consistent with former commitments to sell their products or to raise donations.

probability of contributions is higher the closer the relationship to the requester (Freeman, 1997).

The institutional environment affects pro-social behavior in various respects. There is, however, still insufficient understanding of "how a large array of contextual variables affects the processes of teaching and evoking social norms; of informing participants about the behavior of others and their adherence to social norms; and of rewarding those who use social norms, such as reciprocity, trust, and fairness" (Ostrom, 2000: 154).

3.4 Discriminating Between Theories of Pro-Social Behavior

A number of exclusively experimental studies attempt to discriminate between the various theories of pro-social behavior (see Fehr and Schmidt, 2003). The results are mixed with regard to which model best explains such behavior. While, for example, reciprocity models are shown to explain behavior in various public good situations, in other situations, e.g. dictator games, pro-social behavior cannot be due to reciprocity. Similarly, some experiments show that people are motivated by inequality aversion, while others support the notion that people are concerned with overall efficiency independent of equality. It is too early to conclude whether one theory is most appropriate to explain pro-social behavior. In the second part of the thesis, therefore, further evidence on pro-social behavior in a naturally occurring setting is presented, which should shed further light on what motivates people to behave pro-socially. Still too little field evidence exists to be able to discriminate between the various theories. An exception is the empirical evidence that government grants do not completely crowd out private contributions to public goods, which supports the notion that people cannot be solely motivated by pure altruism.

The divergent results may show that there is no single motive that can explain pro-social behavior in general. More likely, the aforementioned motivations are conditional on specific situations. The empirical evidence mentioned in this section points out some conditions which trigger certain motives.

The contributions to a local public good, as simulated in public good experiments, depend on 'conditional cooperation'. If people are confident that they are not being 'free-ridden' by others, they will be prepared to contribute to the public good. However, if people perceive the behavior of others as consciously free-riding, their willingness to contribute will decrease substantially. People may base their expectations on indicators such as 'seed' money, lists of other contributors or observation of behavior in past similar decision situations. Such

'conditional cooperation' can be interpreted as reciprocity or conformity. Because some people are prepared to bear costs to punish 'selfish' behavior, the possible enforcement of norms will also urge 'selfish' individuals to behave pro-socially. This reciprocity motive can be detected especially in the self-governance of common-pool resources (Ostrom, 1990) and in laboratory public good experiments (Fehr and Gächter, 1998). Of course, other factors matter as well, such as the degree of anonymity, whether communication is possible, whether the decision is repeated, how large the marginal returns on contributions are, and what the size of the group is. The salience of interdependent utility in small groups is likely to be an important reason why reciprocity is crucial in this context. Everybody knows that the free-riding of a minority decreases the individual's pay-off. However, in situations where interdependence is not as salient, 'conditional cooperation' may not be as important. For example, whether your neighbor contributes to the World Wildlife Funds or not does not obviously influence your well-being. It is therefore important to better understand which conditions trigger the various motives, such as whether conditional cooperation is sensitive to group size, and whether people care only for their reference group. It is conceivable that people do not care how many individuals contribute to public radio in total, but that they do care whether their reference group does.

In the case of charitable giving or 'dictator game' situations, reciprocity is less important and sometimes even not possible due to the decision situation. It is hard to imagine that a street child in Brazil will ever reciprocate a donation. Altruism and 'warm glow' giving can, however, explain the large amount of money donated. The probability of pro-social behavior increases with the degree of identification (Bohnet and Frey, 1999b) and with the neediness of the recipient. Altruism and 'warm glow' giving is very sensitive to contextual factors, because with a slight variation in the institutional environment, the expected 'warm glow' can change. The same can be said about the more general phenomenon of intrinsic motivation. As more fully discussed in the following section, the design of institutions can dramatically influence the intrinsic motivation to behave pro-socially. Whether people think that their contribution behavior is voluntary or whether they perceive it to be enforced is an important factor in the pleasure they get from pro-social behavior and ultimately influences the extent of such behavior.

In sum, there is still a lot to learn about the motives for pro-social behavior. The focus has to be more on which conditions may trigger the various motives for pro-social behavior. As is undertaken in the second part of this thesis, more field evidence needs to complement the

findings from laboratory experiments. In the following sections, two other important factors for the understanding of pro-social behavior are discussed: the importance of monetary incentives and heterogeneity with respect to pro-social behavior.

4 Monetary Incentives and Pro-Social Behavior

From an economic point of view, people's pro-social behavior should depend on the relative cost of behaving that way: the more 'expensive' pro-social behavior is, the less it should be undertaken. Relative prices and incentives can be understood as important factors in the institutional environment discussed above. In this section, the effects of monetary incentives on pro-social behavior are investigated in more detail. According to standard economic theory, if contributing time and money to public goods becomes less expensive, people should undertake these activities more.

When people react systematically to changes in the cost of pro-social behavior, this opens up the opportunity to subsidize pro-social behavior in order to increase it. In the case of charitable giving, there are two possible approaches to subsidizing pro-social behavior. Firstly, donors can receive a rebate on the donated amount. In various countries, people are able to deduct their charitable giving from their taxable income. When a person faces a marginal tax rate of 20 percent, a donation of $1 only costs $0.8, because this person will save $0.2 in taxes. The price of a donation with tax deductions is therefore *1-s* where *s* represents the tax rate. Secondly, a third party can match donations. Besides the public sector, this mechanism is popular in a number of corporations in the U.S. and Europe, where employers match charitable contributions made by their employees. To contribute a total of $1, the donor has only to donate $0.8 which will be matched by 0.2$. A matching rate is equivalent to a rebate rate when $s_m=s/(1-s)$. Such monetary incentives to increase pro-social behavior can of course be implemented in all areas where pro-social behavior is involved: volunteering, littering, organizational citizenship behavior, etc. In what follows, two contradictory effects of monetary incentives on pro-social behavior are presented: (1) according to the ordinary *relative price effect*, pro-social behavior will increase when monetary incentives are provided; (2) in certain circumstances, monetary incentives may, however, decrease intrinsic motivation to undertake the pro-social behavior due to a *motivational crowding-out effect* (Frey, 1997a). The net effect of monetary incentives on pro-social behavior may be positive or negative in

such circumstances, depending on the magnitude of the two effects. Under specific conditions, the relative price effect can thus be reversed.

4.1 Relative Prices of Pro-Social Behavior

The importance of the relative price effect for pro-social behavior can be illustrated by the opposition of very wealthy US citizens to a recent tax reform proposal. A group of rich citizens centered around Bill Gates, the founder of Microsoft, has been arguing against the introduction of a new tax law that would basically lower the tax burden for wealthy people. This unusual opposition against tax reductions, especially the repeal of the bequest tax, asserts that charitable giving would be reduced dramatically as a result of the tax cuts: "Philanthropy is not solely inspired by the tax code, but the estate tax unquestionably provides a powerful incentive for charitably oriented people to stretch their giving. Estate tax repeal will most likely reduce charitable giving and bequests"(Gates and Collins, 2002).

A substantive literature attempts to analyze whether the presumption that people react to the price of giving is founded on a solid empirical basis. Three results of this branch of research are worth mentioning:

Firstly, estimated price elasticities support the hypothesis that the price of giving is important for pro-social behavior. Due to a number of empirical problems, the estimated elasticities vary from –0.4 to –3.0, but most fall in a range from –1.0 to -1.3 (Andreoni et al., 1996). Recent studies based on panel data find somewhat lower price elasticities in the range from –0.51 to –1.26 (e.g. Randolph, 1995; Auten et al., 2002). This means, for example, that the elimination of tax deductibility for charitable contributions would increase the price of a unit of giving for a taxpayer formerly faced with a marginal tax rate of 30% from 0.7 to 1.0. Calculating the effect equivalently, charitable contributions would decrease between 15 and 36 percent. In laboratory experiments, e.g. dictator games, a falling demand curve has also been observed (Andreoni and Miller, 2002).[24]

Secondly, substitutes and complements have to be taken into account when analyzing the relative price effect on pro-social behavior. Charitable contributions, for example, can be made in cash (charitable giving) or time (volunteering). If monetary giving and volunteer labor are complements, the above mentioned tax deduction would also increase volunteering.

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[24] Interestingly, men and women have different price elasticities: "(…) when it is relatively expensive to give, women are more generous than men; however as the price of giving decreases, men begin to give more than women" (Andreoni and Vesterlund, 2001: 294). See also Eckel and Grossman (1996b).

If, however, people move away from volunteering when prices for cash contributions decrease, the benefits of such a decrease would be overestimated by ignoring the effect on volunteering. Contrary to standard economic theory, contributions of time and money are mostly found to be gross complements (Brown and Lankford, 1992; Freeman, 1997; Andreoni et al., 1996).[25] The effect of a price reduction on pro-social behavior is therefore understated by focusing solely on monetary giving.

Thirdly, the price of charitable contributions, according to economic theory, should also depend on opportunity costs. This is, however, seldom confirmed. Especially for volunteering, the opportunity cost of time (i.e. individual wages) can hardly explain differences in volunteer activities (see Freeman, 1997). Unemployed persons offer less volunteer labor, although they have lower opportunity costs for their time, and with rising income, people increase their volunteering instead of substituting it for cash donations.

The spectrum of situations in which monetary incentives matter for increasing pro-social behavior is much wider than just tax reductions for charitable contributions considered in the studies discussed so far. In many further situations differences in relative prices explain a large degree of the variation in pro-social behavior. For example, to increase environmental protection, monetary incentives are being considered or are already implemented. An illustrative case is presented by Diekmann (1995). The author compares the consumption of electricity by people in the city of Berne with the corresponding consumption by people in Munich. While in both cities people report the same level of concern for environmental problems and have similar intentions towards ecological responsibility, in Munich 69 percent of the people reported that they reduced the heating when leaving the house or apartment for a longer time, while in Berne only 23 percent did so. It comes as no surprise to the economist that the difference can be explained by the fact that in Munich many more households have an individual heating bill than in Berne.

To summarize, the research on price elasticities of charitable contributions and behavior in various incentive situations supports the view that people react to changes in relative prices. However, many of the observed patterns cannot be explained by relative prices alone, and it is difficult to account for the level of pro-social behavior. Surprisingly, the introduction of the price mechanism in areas formerly based on purely voluntary contributions can backfire

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[25] An exception from this general result is the study by Duncan (1999), who finds that monetary donations and volunteering are substitutes.

under certain conditions. This is the case when the motivational crowding-out effect dominates the relative price effect. The next section discusses the theoretical foundations of and the empirical evidence for this motivational crowding-out effect.

4.2 Motivational Crowding Effect

The law that is probably most important in economics, the relative price effect, does not always hold. In certain situations, a motivational crowding-out effect can work against the relative price effect (Frey, 1997a). This is of considerable importance for pro-social behavior. Due to the underlying incentive structure, contributions in social dilemmas are not utility-maximizing in strictly monetary terms. People who contribute in an anonymous situation to a public good must have an intrinsic motivation to do so. Incentives may undermine or even crowd-out a motivation to behave pro-socially. Incentives can be understood in a narrow sense as positive or negative monetary incentives (rewards or punishments). In a broader understanding, all sorts of regulations can yield a motivational crowding effect.

The motivational crowding effect was known in psychology long before economists started to think seriously about the 'hidden costs of reward' (Lepper and Greene, 1978) or the 'corruption effect' (Deci, 1975). An exception is Titmuss' book on *The Gift Relationship* (Titmuss, 1970), where he argues that monetary incentives for blood donors will undermine their motivation and reduce the amount of blood donated overall. Whereas Titmuss did not present any serious empirical evidence, a considerable amount of evidences has since been collected on the motivational crowding-out effect (for an extensive survey, see Frey and Jegen, 2001). In psychology, the large number of experimental studies on the crowding effect has led to several meta-analyses that in general support the finding that (external) incentives have detrimental effects on intrinsic motivation (e.g. Deci et al., 1999).[26] In economics, the few studies which explicitly test the crowding-out effect cover a wide range of activities involving pro-social behavior. This section limits discussion to the three cases of volunteering, civic duties and trust relationships.[27]

The introduction of monetary incentives has been found to reduce the *work motivation of volunteer*s (Gneezy and Rustichini, 2000; Frey and Goette, 1999). Frey and Goette show in an econometric study that, while the size of the offered financial reward raises the number of

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[26] For a meta-study declaring the crowding effect to be 'a myth', see Eisenberger and Cameron (1996). For an evaluation of the two contradictory meta-studies, see Lepper et al. (1999).

[27] For an overview of studies on crowding effects in labor relations with a special focus on pay-for-performance schemes, see Osterloh and Frey (2000).

hours volunteered, the mere fact that financial compensation is provided significantly reduces the amount of volunteering. Volunteers receiving the median amount of monetary incentive work less than either people who receive a large reward or those who receive *no* reward at all, a result that supports the crowding-out effect and has, of course, important implications for policies regarding volunteer work. The evidence points especially to two important aspects of the crowding effect:

(1) The introduction of (external) incentives does not change the compensation scheme marginally from zero monetary incentives to very little compensation, but it dramatically shifts the perception of the decision situation on the whole. In the situation with extrinsic incentives, people seem to behave in an 'exchange mode', where they make strategic considerations and start to calculate ('I am not working for only $5 per hour, am I?') (Gneezy, 2003). In contrast, in a situation without external incentives, people seem rather to behave in a 'moral mode' where pro-social behavior is rewarded internally, such as with a 'warm glow'.

(2) Small amounts of extrinsic incentives in particular are expected to have large negative effects on observed pro-social behavior, because with large extrinsic incentives the relative price effect will dominate. This is supported in a field experiment by Gneezy and Rustichini (2000), who offered extrinsic incentives to children who voluntarily collected monetary donations. Small extrinsic incentives are found to reduce the motivation of volunteers significantly, while the relative price effect dominates when large incentives are offered. This effect can be observed with negative incentives (fines) as well as with positive incentives (rewards) (Gneezy, 2003).

Other important crowding effects have been discovered for activities which require intrinsic motivation in the form of *civic duty*. Frey and Oberholzer-Gee (1997) investigate motivational crowding-out in the context of siting locally undesirable projects (so-called 'Not In My Backyard' or NIMBY problems). Economic theory proposes a simple solution for such projects, which are often socially desirable but impose considerable costs on the immediate neighbors; communities which host the NIMBY project should be compensated by all the other communities, so that their net benefit becomes positive. Frey and Oberholzer-Gee analyzed the reaction of Swiss residents to such compensation for the acceptance of a nuclear waste depository. While more than 50 percent of the respondents agreed to host the depository without compensation, the offering of monetary incentives reduced the acceptance rate to 24 percent. The authors' favored explanation for this reduction is that the sense of civic virtue

that accompanies accepting the noxious facility is crowded out by the offer of monetary compensation. Civic duty to behave pro-socially can be crowded out not only by explicit monetary incentives, but also by the design of a constitution. An important application of this notion is tax morale, where the crowding effect can have huge costs. Tax morale, or the motivation that explains the 'low' tax evasion in many countries, depends to a great extent on trust between the government and the citizens. A constitution which tries to discipline citizens can be perceived as distrusting and therefore decrease civic virtue (see Frey, 1997b for empirical evidence).

More generally, the introduction of monetary incentives can have considerable negative effects on *trust*-based pro-social behavior. In a laboratory experiment with CEO's, Fehr and List (2002) found that detrimental effects follow from external incentives. If the first player uses an external incentive in a trust game, the second player returns less money. However, the highest efficiency is reached if it is possible to implement an external incentive but certain subjects explicitly trust in each other, so that they do not use the incentive mechanism. Therefore, while in general trust is crowded out by external incentives, incentives also seem to allow for exhibiting trust when they are explicitly not used.[28] The authors interpret the negative effect of incentives in terms of reciprocity. The explicit threat to punish shirking is perceived as distrust and a reciprocal agent increases shirking as a response to such a hostile act. Bohnet et al. (2001) conducted a study where subjects have to decide whether they want to enter a contract without knowing whether the partner will perform. Economic theory expects that a higher probability of contract enforcement will increase contract performance. The authors, however, report a crowding-out effect: in a situation of weak contract enforcement, trustworthiness (i.e. people do perform contracts) is higher than in a situation of medium contract enforcement; only if contract enforcement is increased well past the medium mark are contracts performed again. The findings support the notion that medium or low incentives can crowd out trust and intrinsic motivation.

Without doubt, it cannot be expected that extrinsic incentives *always* lead to a motivational crowding effect. The present state of research allows one to indicate conditions under which extrinsic incentives have more positive or more negative effects. A discussion of these identifiable conditions makes it clear that crowding effects are of particular importance for pro-social behavior:

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[28] This result is also found in experiments by Fehr and Rockenach (2003) and Fehr and Gächter (2002).

(1) Intrinsic motivation can only be crowded out by extrinsic incentives if people have an intrinsic motivation to begin with. If, for example, people only undertake a task due to extrinsic motivation, an increase in extrinsic incentives will certainly increase effort, as predicted by standard price theory. However, to contribute time or money to a public good often involves some sort of intrinsic motivation. The introduction of external incentives to increase pro-social behavior must therefore be considered very carefully.

(2) A motivational crowding-out is expected if the external intervention is perceived as *controlling*. Psychologically, extrinsic incentives can have negative effects when they reduce the perceived self-determination of individuals (Rotter, 1966; Deci, 1975), or when they interfere with a relationship based on mutual trust (Rousseau, 1995). As self-determination and trust are important for pro-social behavior, the introduction of external incentives can seriously reduce the intrinsic joy of behaving pro-socially. However, if extrinsic incentives are applied carefully, e.g. acknowledging individuals' intrinsic motivation, they may not be perceived as hostile and controlling, and can even support and increase pro-social behavior (the crowding-in effect).

(3) A motivational crowding-out effect only results in a net negative effect on behavior if it dominates the standard relative price effect. As mentioned before, this is most likely to be the case for (positive or negative) incentives that are small. Motivational crowding, however, is not thereby rendered irrelevant in the context of pro-social behavior. First, there are many situations where small incentives are quite important. In the case of pro-social behavior, the introduction of small incentives is widely discussed, as in the context of volunteering. Second, the reliance on extrinsic incentives may lead to a selection of certain 'selfishly'-oriented people. Whereas for some tasks it is desirable to attract extrinsically motivated people (see e.g. Lazear, 2000), in other areas like the non-profit or charitable sector this is not very welcome (e.g. Besley and Ghatak, 2003). Third, if by the crowding effect pro-social preferences are affected permanently, pro-social behavior will not reach the original level again, even if the extrinsic incentive is removed.[29] Fourth, extrinsic incentives for a certain task may not only reduce the intrinsic motivation for the particular task, but also spill over to other areas (Frey and Benz, 2000). Even small incentives may then destroy intrinsic motivation in areas that are actually not subject to the

[29] However, little is known about whether a motivational crowding-out is due to a change in preferences (Frey, 1997a) or to the perceived nature of the task (Bénabou and Tirole, 2002), nor about how exactly intrinsic motivation is rebuilt after an extrinsic incentive is removed.

external intervention. The detrimental effect of extrinsic incentives may even be worse in the dimension not directly affected.

To summarize, extrinsic incentives can crowd out intrinsically motivated pro-social behavior if the external intervention is perceived as controlling by the individuals affected. This effect is supported in a large number of laboratory experiments and in some field studies. If the motivational crowding effect is strong and dominates the standard economic relative price effect, an extrinsic incentive can lead to a negative overall effect on behavior. As intrinsic motivation in one form or another is essential for pro-social behavior, the motivational crowding effect is of particular importance in this context.

5 Heterogeneity in Individuals

In standard economic theory, preferences are usually assumed to be homogeneous. This unrealistic assumption is often no obstacle to derive powerful predictions, even with regard to pro-social behavior. However, taking the variation in pro-social attitudes into account leads to interesting additional implications. To begin with, there are significant differences between individuals: Andreoni and Miller (2002) show in a study based on dictator games that about 47 percent of individuals' behavior can be characterized as selfish (however, only 23% are perfectly selfish), while the behavior of the other 53 percent has to be characterized as 'other regarding'. Fischbacher et al. (2001) find in a public good game that 30 percent of the individuals behave like free-riders and 50 percent can be characterized as 'conditional cooperators'. Psychologists have for decades distinguished individual motivations using survey answers. They typically classify people into four types: altruists, who care only for the utility of others; competitors, who want to do better than their counterparts; cooperators,[30] who pursue the best for themselves and the others; and individualists, who only look out for themselves (McClintock, 1972; Kelley and Stahelski, 1970). A study by Liebrand (1984), for example, suggests that individuals can be classified as 5 percent altruists, 10 percent competitors, 31 percent individualists and 53 percent cooperators.[31]

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[30] In economics, cooperators are labeled altruists.
[31] See also Offerman et al. (1996), who find somewhat lower rates of cooperative subjects.

But why should economists deviate from the 'golden rule' of assuming preferences to be given and identical? Why is the heterogeneity of preferences important? At least three reasons for the analysis of heterogeneous pro-social preferences are worth mentioning:[32]

(1) The *interaction of different types* of people is crucial to understanding why cooperation is stable and public goods are provided. Consider, for example, the situation in which an egoistic individual is interacting with a reciprocal individual. The presence of a reciprocal individual may change the material incentive of the egoist and therefore urge the egoist to behave 'pro-socially'. The presence of only a few reciprocal types may have a big impact on the aggregate outcome of markets and organizations (see the survey in Fehr and Fischbacher, 2002). Whether a pro-social individual will urge an egoist to behave pro-socially or, conversely, a few egoists urge pro-social individuals to start free-riding is a question that depends crucially on the institutional setting. In the absence of punishment for free-riding, are pro-social individuals likely to start behaving in a self-interested way?[33] To analyze the institutions which lead to one of the two cascades, one has to understand how heterogeneous individuals interact.

(2) The *institutional environment may influence individuals differently*. In analyzing the effect of a change in the institutions, it is important to take people's heterogeneous preferences into account. In the case of tax reductions for charitable contributions, for example, evidence show that only altruistically-inclined people are affected by the change in relative prices (Clotfelter, 1980). People who did not donate to charities are not affected by such a change. Chapter V presents additional evidence from a controlled field experiment showing that only certain types of people react to a change in relative prices. In addition, people may react quite differently to the introduction of monetary incentives with respect to their motivation to behave pro-socially (Frey, 2002). Pro-socially inclined persons may reduce their intrinsically motivated pro-social behavior when external incentives are introduced, whereas a selfish individual may react quite differently.

(3) The *evolution of heterogeneous pro-social preferences* can help one to understand how pro-social preferences can be fostered. Very little is known about this question in

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[32] Caplan (2001) discusses the relevance of preference-based explanations for a wide range of economic questions.

[33] Because an altruist mimics the behavior of an egoist every time he or she meets one, expectations about others differ between the two types. An egoist believes that everybody is an egoist because he or she only meets people who behave egoistically, while an altruist knows that there are egoists and altruists (Kelley and Stahelski, 1970). For a test of this 'triangle hypothesis', see van Lange (1992).

economics. One prominent position, however, is that education can influence pro-social behavior and probably even preferences. Economics and business students in particular are assumed to be better citizens and better future managers if they are taught some ethics instead of self-interest maximization. Economics students are portrayed as being more egotistical than non-economists, partly because the training changes their behavior (e.g. Frank et al., 1993a; 1996). However, as will be shown in chapter VI, it is important to check whether people have heterogeneous pro-social preferences and whether, in the case of economics, those who choose the subject already tend toward egoism when they enter. In that case, it is possible that "economists are born, not made" (Carter and Irons, 1991).

6 A Note on Utility and Pro-Social Behavior

6.1 Why Should Economists Take Utility Into Account?

In the history of ideas, pro-social behavior has always been linked with human welfare. In the Judeo-Christian tradition, helping others is the only way to reach the ultimate goal of happiness. The founding father of what is called 'virtue ethics', one of the major approaches in normative ethics, is the Greek philosopher Aristoteles, who posited that true happiness is found in the practice of virtue. A happy person is thus a moral person.[34] In the Enlightenment, the father of modern economics, Adam Smith, also saw pro-social behavior as *the* path to well-being: "Concern for our own happiness recommends to us the virtue of prudence: concern for that of other people" (Smith, 1759: 385). Empirical evidence, however, is still lacking to prove that a person who acts pro-socially is happier than a *homo oeconomicus*, who is solely concerned with his or her narrow self-interest. To answer the question of what constitutes 'the good life', which is also the happy life, one has to understand how pro-social behavior influences utility (happiness).

Until recently, modern economics has had no statement to make about the content of utility. Utility was assumed to be equivalent to preferences, which could only be measured by looking at revealed behavior. It has been said that modern economics should not concern itself with utility because, on the one hand, precise knowledge about utility is not important and, on the other hand, utility or well-being cannot in any case be measured (Frey and Stutzer, 2002a: 19-47). Economists are therefore reluctant to accept the notion that there may be ways of

[34] For an overview of virtue ethics, see Almender (2000).

measuring utility and for a long time the discipline of economics refused to validate any kind of utility measurement.

In recent years, an ever-growing community of economists is reconsidering the rejection of utility measurement. They have good reasons to rethink the utility concept because measuring utility enables them to analyze the basic assumption of economics (e.g. 'Do people always maximize their utility?') and to discriminate between different models ('Are drug addicts really rational?') (Frey and Stutzer, 2003a). In the case of pro-social behavior, two important aspects of analysis can be enriched by the utility concept and by measuring well-being:

(1) It is now well established that people violate the basic self-interest hypothesis in various important ways. As mentioned before, pro-social behavior can be explained by motives such as altruism or some sort of inequality aversion. The measurement of utility allows one to better discriminate between different theories and to answer questions about whether another person's increase in utility positively affects one's own well-being or whether people actually suffer from inequality.

(2) People can voluntarily make decisions which do not lead to higher utility. They may not even know what exactly makes them happy. There may be a number of reasons why individual decisions are not always welfare-enhancing. People's decisions may, for example, be influenced by a 'projection bias' (Loewenstein et al., 2003), where future utilities are systematically mispredicted because preference adaptation is underestimated. Frey and Stutzer (2003b) elaborate this idea further by showing that people's misprediction of future utility depends on the nature of the good/activity. The benefits from intrinsic goods are systematically underestimated compared to the benefits from extrinsic goods. People may, for example, underestimate the utility they get from volunteering (intrinsic activity) compared to earning money on the market (extrinsic good). Such mispredictions of future utility may lead to suboptimal decisions for *individuals'* welfare. Even if 'helping others' were a source of happiness, individuals would not opt for such activities frequently enough to maximize their utility. Some people even incorporate goals which do not lead to happiness but are instead self-defeating (Schooler et al., 2003). Ryan et al. (1996; see also Kasser and Ryan, 2001) attempt to show that some goals are more satisfying than others, in the sense that people who are oriented towards material and other external rewards are less happy than people who have more intrinsic life goals.

6.2 How Can Utility Be Measured?

A growing literature in economics measures utility in terms of survey answers about happiness or life satisfaction (for surveys, see Frey and Stutzer, 2002b; 2002a; Easterlin, 2002). These measures of subjective well-being, which have been used for decades in psychology (see e.g. Kahneman et al., 1999; Diener et al., 1999), are shown to be valid proxies for utility. The responses to questions like 'How satisfied are you with your life, all things considered?' on a scale from 0-'completely dissatisfied' to 10-'completely satisfied' are correlated with other proxies of happiness like how often people smile, how friends and relatives value a person's well-being, how a person's heart rate and blood pressure indicates response to stress, etc. (see Konow and Earley, 2002). The 'Economics of Happiness' has documented the influence of various factors on individuals' welfare. Starting with Easterlin (1974), who found that although income rose dramatically in the US levels of happiness stagnated, a number of subsequent papers on happiness have documented the influence of unemployment (Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998), inflation (Di Tella et al., 2001), political institutions (Frey and Stutzer, 2000), the role of social norms (Stutzer and Lalive, 2004) and excise taxes (Gruber and Mullainathan, 2002). As this branch of research shows that the use of subjective well-being can fruitfully be applied to economic questions, this can now be taken a step further to investigate the effect of pro-social behavior on happiness.

6.3 How Does Pro-Social Behavior Affect Happiness?

The various theories on pro-social behavior lead to different predictions concerning utility gained from such behavior. In the following, these predictions are presented alongside the scarce empirical evidence gleaned in economics and evidence documented in psychology and sociology. The focus will be on two theoretical branches: (1) theories of altruism and inequality aversion, and (2) theories of 'warm glow'. Special attention is given to issues of causality. Open questions for future research will be discussed.

6.3.1 Inequality and Happiness

According to theories of altruism and inequality aversion, people's well-being increases if they observe that other people's lives are improving or that inequality between two individuals and/or social inequality is decreasing. Importantly, the increase in utility occurs independently of one's own contribution, whereas according to impure altruism one's own contribution is a substantial source of the 'warm glow' coming from pro-social behavior. A

few studies have investigated the overall effect of inequality as well as the effect of other people's material well-being on individual happiness levels. Alesina et al. (2003) find that people are less likely to report being happy when inequality is high. This 'inequality aversion', however, is more pronounced in Europe than in the United States. Interestingly, the effect of inequality on the well-being of the poor versus the wealthy differs on the two continents. Whereas in the United States only the wealthy seem to suffer from the effect of inequality, in Europe only the well-being of the poor is decreased by higher inequality. However, if 'equality' is a luxury good or a normal good, then rich Europeans should suffer more from inequality than poor Europeans, as is the case in the United States. The authors interpret this result, which is inconsistent with pure inequality aversion, as an effect of differences in social mobility between European countries and the United States. Because social mobility in the United States is perceived to be higher, wealthy US citizens interpret high inequality as a risk of falling down the scale in case of an unfortunate life event. According to the authors, poor US citizens believe that they can improve their income situation substantially if they just make more of an effort. In contrast, poor Europeans feel stuck in poverty. People may therefore not only care about inequality outcomes (whether the income distribution is more or less unequal) but also about the process leading to a certain result (whether it is in the individual's power to influence an outcome).[35] However, Schwarze and Härpfer (2002) find evidence consistent with inequality aversion in Germany for all income classes. In their panel survey, people's life satisfaction is inversely related to inequality on the regional level.

Charness and Grosskopf (2001) find no correlation between happiness scores and preferences for equality in dictator games. Subjects who choose more equal payoffs do not report better well-being *after* the decision, nor do subjects who report higher happiness scores *before* the decision choose more equal payoffs. Thus, the experiment does not support the hypothesis that happiness is correlated with inequality. However, overall happiness measures are explicitly designed not to be too sensitive to minor life events. They are therefore not expected to be influenced by the results in a laboratory experiment involving low stakes. Much more research is needed to understand how the utility levels of others influence one's own happiness.

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[35] The importance of processes for utility is often neglected in economics. For a survey on procedural utility, see Frey et al. (2003).

6.3.2 Pro-Social Behavior and Happiness

Theories of impure altruism predict that pro-social behavior as such increases utility. Happiness can be achieved by making other people happy. In this branch of research, the focus is on the effect of pro-social behavior per se on subjective well-being. Various studies by psychologists and sociologists, which mostly focus on volunteering, find positive correlations between pro-social behavior and well-being (for a survey, see Wilson and Musick, 1999). Volunteers report higher well-being scores than non-volunteers; they are less depressed, and their mortality rate is lower than average. These effects are found to be especially true for elderly volunteers (see also Wheeler et al., 1998).

People may get a 'warm glow' from volunteering because helping others increases either their perceived self-esteem or their self-efficacy (Wilson and Musick, 1999: 154). Volunteering may also generate a state of 'flow' (Csikszentmihalyi, 1990), which depends on the extent of commitment, the use of skill and the kind of achievement involved in the task (Argyle, 1999: 364-365). Alternatively, the positive effect of pro-social behavior in the form of volunteering may be due to the effect of social integration. People who feel integrated and enjoy many personal relationships are taken to be happier than people who feel lonely. According to this explanation, volunteering increases people's well-being not because they help others but because they do it in a group and feel integrated. Most studies on the effects of pro-social behavior on happiness (mostly on volunteering) cannot discriminate between utility arising from the act of helping and utility arising from 'side-effects' such as social involvement. In addition, most empirical work uses cross-sectional data where participants self-assess the impact of volunteer programs. Apart from problems arising from response biases in volunteers who self-assess the benefits of their own program, the direction of causality is very difficult to assess in such studies. In fact, pro-social behavior may not make people happier so much as happier people are more willing to behave pro-socially. There is some evidence that happiness affects one's willingness to help others. In a number of experiments, the mood of subjects was first manipulated, e.g., by letting them 'find' a coin or by letting them win in a game. Afterwards, the subjects had the opportunity to help in a task or to donate money to a charity. It is found that those with induced good moods were more likely to help others (Isen et al., 1997; Harris and Smith, 1975).[36]

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[36] The 'negative-state-relief' theory in psychology (see Cialdini et al., 1982) proposes exactly the opposite: people in a bad mood behave more pro-socially because they think that doing good lifts the bad mood.

Konow and Early (2002) use simple dictator games to disentangle the various effects that influence the relationship between happiness and pro-social behavior. The authors ask the subjects various questions about their subjective well-being either before or after a decision on dividing an amount of money between another person and the subjects themselves. The results indicate an indirect relationship between pro-social behavior and happiness: generosity contributes to self-actualization, which in turn increases long-run happiness. Pro-social behavior may therefore not immediately increase happiness because "self-actualizing behavior may be at odds with short-run happiness" (Konow and Earley, 2002: 21). In the long run, however, pro-social behavior increases happiness. Much more research about happiness is needed to fully understand the relationship and the causality between pro-social behavior and well-being (utility). In chapter VII, the relationship between volunteering and well-being will be analyzed empirically for the case of Germany using a large panel data set.

7 Concluding Remarks and Open Questions

The evidence is overwhelming that human behavior is not solely motivated by narrow self-interest. People accept cost when they voluntarily contribute money or time to public goods and, in a second stage, when they enforce social norms. Such pro-social behavior is widespread and quantitatively important for economic and societal outcomes. To analyze many aspects of human behavior, it is essential to better understand motivations beyond self-interest and the conditions under which they prevail. Ultimately, when designing institutions, such as the basic rules applied in a society, pro-social behavior has to be taken into account. If not, the institutions may not reach their intended goals.

In recent years, a number of theories have evolved which attempt to explain pro-social behavior. The most important approaches presented in this survey can be classified into three groups: (1) those which emphasize the distributional outcome, as do theories of pro-social preferences; (2) those which highlight the importance of the process that leads to a certain outcome (e.g. the intentions of the people involved), an aspect stressed by theories of reciprocity and social comparison; and (3) those which focus on the significance of the institutional environment for pro-social behavior. The predictions derived from these theoretical approaches are tested against empirical evidence gathered in field studies and laboratory experiments. In particular, the predictions about people's reactions to the pro-social behavior of others differ quite substantially amongst the theoretical approaches. Whereas altruism

theories predict that people will decrease their contributions to a public good if other persons or the state increases their share, theories of 'conditional cooperation' make exactly the opposite prediction with regard to the behavior of other individuals. So far, however, there is no field evidence clarifying which of the two theories is better able to explain human behavior.

The theoretical approaches and the respective empirical studies surveyed in this chapter indicate that it is still too early to make conclusive statements about the importance of the various pro-social motivations. The interrelation between theory and empirical evidence, where theoretical hypotheses are empirically tested and, conversely, empirical results inform and influence theoretical reflections, needs to be put under more pressure in order to better understand pro-social behavior. However, the survey indicates that many interesting insights can be gained from economics research on pro-social behavior. Some of the open questions will be addressed in the empirical part of the thesis.

The most important insight developed in this survey is the effect of the institutional environment for explaining pro-social behavior. On the one hand, the institutional environment affects the salience of particular social norms, as well as the intrinsic motivation to behave pro-socially. On the other hand, it influences the social interaction between (egoistic and/or altruistic) individuals, as in how the violation of a social norm can be punished. It is, for example, frequently observed that people do not like income inequality and that they especially hate to be worse off than others. In certain institutional settings, however, individuals pursue a socially efficient outcome and accept greater inequality, even if their relative standing in the income distribution is low. How exactly these differences in pro-social behavior are to be explained by differences in institutions, though, remains an area of substantial future research.

Similarly, a great deal of evidence exists that emphasizes the importance of reciprocity for pro-social behavior. If the institutional setting allows for the sanctioning of free-riding, such as when the group is small and free-riders can be targeted, high levels of contributions can be achieved. In the interaction between heterogeneous individuals, free-riders are punished and forced to behave pro-socially. But even in the absence of such a mechanism, e.g. in the case of blood donation or voting, people are prepared to behave pro-socially. In these situations, people seem to have an intrinsic motivation to behave pro-socially that is not conditional on the behavior of others. Intrinsic rewards from behaving pro-socially again depend on the institutional settings and can either support or destroy the motivation. The question about

which institutions increase the salience of reciprocity or influence the intrinsic rewards arising from pro-social behavior still needs to be explored in more detail.

The survey reveals a great number of open questions, which should guide research on pro-social behavior in the future. In the second part of the thesis, four important aspects are addressed:

(1) *Social comparison and pro-social behavior*. A small number of studies reveal that people's pro-social behavior is conditional on what others do. The willingness to behave pro-socially increases with the average pro-social behavior of the reference group in the laboratory. This result has to be further investigated in the field. The following empirical part of the thesis presents an initial attempt to test 'conditional cooperation' in a field experiment. Such interactional effects are important to understand, because they may explain human behavior in a variety of situations. For example, crime is almost impossible to fight in areas where nobody obeys the law and nobody wants to be the only one who does so. The conditions under which such a 'bad' equilibrium evolves are not well understood. The same holds for the conditions under which such social comparisons are more or less pronounced. In addition, it is still unclear what motivates the positive correlation between one's own and others' behavior. Is it due to conformity or reciprocity? Or does the behavior of others just work as a signal?

(2) *Influence of institutions on pro-social behavior*. Institutions may interact with pro-social behavior in various ways. For economics, it is important to analyze the effects of changes in relative prices and competition on pro-social behavior. In the empirical part, the effect of a change in the relative prices is investigated. The overall effects of the interaction between institutions and pro-social behavior may be at odds with standard economic theory. In particular, the institution of the price system may have serious detrimental effects on pro-social behavior, because people who behave pro-socially are either motivated by some intrinsic reward or are themselves a special selection of people.

(3) *Pro-social behavior and happiness*. Ultimately, research in economics should focus on the effect of pro-social behavior on utility. New developments in economics have advanced ways of measuring utility using subjective survey data. The availability of utility measurements enables the investigation of many aspects of pro-social behavior which could not be tackled to date. The empirical answer to the question of whether or not pro-social behavior increases utility can provide important insights into the motivations for

pro-social behavior; the ultimate question is whether pro-social behavior actually makes people happy.

(4) *More field evidence*. Future research should be much more based on field evidence. Most empirical research on pro-social behavior has been based on laboratory experiments. Results from lab experiments have greatly improved our understanding of behavior beyond self-interest. However, it is still unclear how these results apply to the world outside the laboratory, because too few studies exist which test the theories on pro-social behavior in real-life settings. A special feature of this survey has been to focus on the few existing field studies. Of course, the external validity of field studies comes at the cost of internal validity, but the trade-off has to be evaluated depending on the respective research questions. The best of both worlds can be achieved by undertaking controlled experiments in the field. In the empirical part of the thesis, a naturally occurring decision setting is analyzed and controlled field experiments are undertaken.

Some of these open questions are addressed in the second, empirical part. For the empirical analysis two data sets are used: (1) contributions of students to two social funds at the University of Zurich and (2) decisions to volunteer by the general population in Germany surveyed by the German Socio-Economic Panel (GSOEP). Chapter III presents the data set from the University of Zurich in detail and analyzes general patterns of pro-social behavior; chapter IV presents a field experiment which tests for the effect of conditional cooperation on pro-social behavior; chapter V presents another field experiment which investigates the effect of changes in relative prices on the decision to contribute to the two social funds; and chapter VI investigates the effect of education on the willingness to donate. Based on the second data source, a large-scale survey data, in chapter VII the results of an investigation into the relationship between volunteering and happiness are reported and discussed. Chapter VIII draws conclusions.

Part B

Empirical Analysis

Chapter III

Pro-Social Behavior in a Natural Laboratory

Empirical evidence that people behave pro-socially does exist and initial approaches have been undertaken to explain this deviation from the self-interest hypothesis. However, as has been shown in chapter II, more field evidence is needed to the crucial step towards analyzing the conditions under which people behave pro-socially. Such an empirical strategy will increase understanding of what ultimately motivates people to contribute to public goods and enable researchers to test the extent to which behavioral results from the laboratory can be generalized to natural occurring situations. In the empirical part of this thesis, pro-social behavior is analyzed using data about contributions to two social funds at the University of Zurich. This data set allows an investigation of pro-social behavior in a natural laboratory, in which *all* students of the University of Zurich have to decide *each* semester whether they want to contribute to two social funds. As a result, a large panel data set can be exploited analyzing contributions to a natural occurring public good.

In this first chapter the first of two data sets is introduced and analyzed on a descriptive level. The descriptive analysis of the general pattern of contributions allows initial insights into the motivation for pro-social behavior. The behavior of the students clearly indicates that people are not solely motivated by self-interest. Even in an anonymous situation, people are willing to contribute positive amounts of money to people who are worse off. Two behavioral patterns are especially interesting in the light of the relative importance of the theories on pro-social-behavior presented in the previous chapter. Firstly, minor changes in the context of the decision have large effects on the contributions to the two funds. In particular, it matters a great deal how students are asked whether they want to donate money. Secondly, the willingness to contribute does not drop off with repetition as dramatically as shown in laboratory experiments. Although there is no possibility of punishing free-riders, contributions do not erode over time. This pattern is interesting in particularly when discussing the norm of reciprocity. However, the descriptive analysis is not conclusive and will be complemented with in-depth analyses of particular aspects in the later chapters.

Section 1 of this chapter presents the data set for this and the following three chapters, which analyze aspects of the same decision setting. The strength and weaknesses of the data set are evaluated and summary statistics are given. Section 2 presents a descriptive analysis of the general pattern of contributions to the two funds. Section 3 points to the problems of a solely descriptive analysis. This section will then be used to present the two econometric models, which address these problems in a multivariate analysis. As these two models will be used throughout the remainder of the thesis, section 3 provides a brief excursus into the statistical methods used here. Section 4 draws concluding remarks.

1 Data Set on Contributions to Two Social Funds at University of Zurich

1.1 Decision Setting

Each semester, every student at the University of Zurich has to decide whether or not he or she wants to contribute to two official social funds in addition to the compulsory tuition fee. On the official form for renewing their registration, students are asked whether they want to voluntarily give a set sum (CHF 7.-, about € 4.7) to a fund which offers low-interest loans to students in financial difficulties (*Loan Fund*) and/or another set sum (CHF 5.-, about € 3.4) to a fund supporting foreigners who study at the University of Zurich (*Foreigner Fund*). Without their explicit consent by marking a box, students do not contribute to any fund at all. Figure III.1 presents the decision situation, to which students must sign their assent. One month later, the students receive an invoice with the compulsory tuition fee plus the selected amount for the social funds.

Figure III.1

Decision to Contribute to Two Social Funds

Would you like to contribute voluntarily to following two social funds:		
Loan Fund (CHF 7.-)	☐ Yes	☐ No
Foreigner Fund (CHF 5.-)	☐ Yes	☐ No

The decisions of *all* students can be observed for the period from the winter semester 1998/99 up to and including the winter semester 2002/03 (i.e. nine semesters). The fact that every student has to decide each semester whether to contribute or not leads to a large number of observations. The giving behavior of 37,588 students can be observed. They decide on average 4.8 times, depending on how many semesters they have attended. The decisions of the nine periods are pooled, which generates 180,225 observations. Table III.1 presents the summary statistics of the data set. Students in the data set from freshmen to Ph.D. students are on average around 28 years old and in the 10th semester.

Table III.1

Summary Statistics

Variables	Data set		Survey data
	Number of observations	Percentage of the student body	Mean (s.d.)
Total number of observations	180,225		3,256
Contributions to at least one fund		69.6	79.7
Age			
Aged below 26	86,385	47.93	
Aged 26-30	49,453	27.44	
Aged 31-35	22,847	12.68	
Aged 36-40	11,024	6.12	
Aged above 40	10,516	5.83	
Mean (s.d.)	27.78 (8.05)		26.66 (5.59)
Gender			
Women	91,062	50.53	47.5%
Men	89,163	49.47	52.5%
Nationality			
Foreigner	21,092	11.70	
Swiss	159,133	88.30	
Number of semesters			
Mean (s.d.)	10.47 (8.21)		6.94 (5.07)
Freshmen	13,685	7.59	
Basic study	40,225	22.32	
Main phase	97,130	53.89	
Ph.D. study	29,185	16.19	
Economics and Business Students	18,603	10.32	12.9%
Non-Economists	161,622	89.68	87.1%
Monthly Income in CHF, mean (s.d.)			1372 (1924)
Percentage earning their own living, mean (s.d.)			57.6 (34.7)
Parents pay the tuition fee			45.4%

Data source: The data set is compiled from data provided by the accounting department of the University of Zurich, 1998-2002. The survey data is based on my own survey study, 2000.

In addition, an anonymous on-line survey was undertaken among the same student population.[37] The response rate was 18 percent. From this sample, 3,256 answers could be used, containing responses to all the questions relevant for the context analyzed. This sample is not totally representative (not surprisingly, a larger number of economics students responded to the questionnaire sent out by an economist), but with respect to gender and age, the sample approximately corresponds to the distribution of students at the University of Zurich (see table III.1 for summary statistics of the survey data set). The survey again asked whether the person contributed money to one or both of the funds. 80 percent responded that they did, compared to the 70 percent who actually contributed. Even taking into account that people in the survey may be in an earlier stage in their studies and therefore more likely to contribute (see section 2.2 for the effect of repetition), the difference is too large to be explained in this way. The difference between survey answers and actual behavior is found in many survey-based studies. While the differences can be the result of people lying (see Eichenberger and Oberholzer-Gee, 1998; Bertrand and Mullainathan, 2001 for differences between hypothetical and real decisions), a more convincing explanation is that people who actually contributed to the funds are more likely to respond to the online survey. The differences should be kept in mind when interpreting the survey data.

1.2 Characteristics of the Data Set

The decision setting of contributions to the University of Zurich's social funds has some special characteristics. They constitute the advantages and also the limits of the dataset. The decision situation has at least four features which are advantageous for analyzing pro-social behavior:

(1) *Naturally occurring decision situation*. The dataset allows the investigation of pro-social behavior in a natural occurring decision. In contrast to decisions in the laboratory, subjects contribute to a real public good in a social context. Such field studies on pro-social behavior are important complements of experimental studies, as has already been argued in the previous chapter. The decision situation includes *all* students from the University of Zurich, which leads to a huge dataset. The fact that all students have to decide whether they want to contribute or not avoids the selection problem of the subject-pool (Ball and Cech, 1996).

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[37] The on-line questionnaire is reproduced at http://www.iew.unizh.ch/grp/frey/fragebogen.htm.

(2) *Controlled environment*. The dataset allows keeping a number of factors constant which might influence pro-social behavior. For example, the decision setting is the same for all the students. They are asked in the same way and around the same time each year whether they are willing to contribute to the two funds. Personal characteristics like age, gender, nationality or field of study can be controlled for. It is, for example, known that gender has a positive influence on donations, but women are also less likely to choose economics as their major. If the analysis does not establish controls for gender, any effect of 'being an economics student' could also be a gender effect. In addition, people decide whether or not to contribute many times in a row, and therefore the dataset has a panel structure. This makes it possible to control for time-invariant, unobservable personal heterogeneity. Controlling for heterogeneity is important because selection effects (e.g. Ph.D. students are a particular selection of people) can be excluded, but also because different 'types' of persons may react differently to experimental interventions. For example, people who never contribute to the two funds may not be sensitive to monetary incentives to increase their pro-social behavior. A within-subject analysis can lead to interesting insights about how preferences revealed by past behavior (the 'type of person') influences the effect of institutional changes on pro-social behavior.

(3) *Anonymity*. The decision to contribute to the two social funds is made anonymously. Students decide at home and send their decision by mail to the University. The data about who contributes to the funds is only known by the administration of the University and is neither communicated to the greater public nor communicated to the administration of the two funds. This anonymity allows the researcher to exclude motives for giving based on prestige or social pressure. As the administration of the funds does not know the name of the students who contributed, having made a contribution is of course not a prerequisite for receiving financial support from the funds at a later stage.

(4) *Repetition*. The decision to contribute to the two funds is repeated every semester. Questions about how people change their behavior with repetition can be addressed. Repetition is important because most real-life decisions have to be taken more than once and therefore learning effects are possible.

The naturally occurring decision situation does, however, have some limitations. Two features of the decision situation have to be kept in mind when interpreting the results of the analysis:

(1) *Only students*. The analysis is by design limited the pro-social behavior of students. Aside from the fact that this has various advantages, in particular because students are an intelligent and quite homogeneous subject pool, the question can be raised whether the results apply to the general population. This thesis cannot provide an answer. However, there are indicators that lead one to expect that the students' behavior is not much different from the behavior of the general population in a similar decision situation. Students in Zurich, for example, normally do not live in students' dormitories but in the city. The exchange with the general population is therefore notable. As a considerable number of the students are at the same time in gainful employment, they also tend to be in close contact with the rest of the population.

(2) *Low stakes*. Students decide about the contribution of a small sum of money. Even if some of the students have little money at their disposal, the contributions are much smaller than in other public good situations. It could be argued that in such low-cost decisions, people behave more pro-socially than in high-cost situations (see Diekmann and Preisendörfer, 2003 for survey evidence). However, a large number of situations where people decide to behave pro-socially are in fact low-cost. People seldom have to decide whether they would be willing to heroically rescue another person.[38] In addition, it could be shown in laboratory experiments that stakes are not as important for the operation of fairness norms (Cameron, 1999; Fehr et al., 2002). In these studies it matters little whether people decide about $ 10 or about an amount equivalent to a monthly salary. Whether this statement also holds for situations similar to the decision at the University of Zurich is an open question. However, the contributions to the two funds can serve as a proxy for more general pro-social behavior. In the online survey, people were asked whether they donate money to other funds (apart from the two social funds) and whether they volunteer. People who contribute to at least one of the two funds are statistically significantly more likely to donate to other funds. 56.5% of people who contribute to the funds also donate to other funds, versus only 48.7% of people who do not contribute to the social funds donating to other charitable funds ($t=3.56$; $p<0.001$). Students who contribute to the two funds also donate more money: on average CHF 259.5 (s.d.=14.4) vs. CHF 197.6 (s.d.=27.3) per year. The difference is statistically significant on the 90%-level ($t=1.87$; $p<0.06$). In the case of volunteering, the situation is less clear. Students who donate to the two funds

[38] As the research on rescuers of Jews in Nazi Europe shows, ordinary people are prepared to help strangers in situations where the costs involve risking one's life (Oliner and Oliner, 1992).

volunteer more, but the difference is not statistically significant. However, one can see that the contributions to the two social funds, even if they are small, can indeed act as some sort of proxy for more general pro-social behavior. In addition, as the amount is similar to the amount used in most experimental studies, the result of the pro-social behavior in the field can be compared to behavior in laboratory experiments.

In sum, the panel data set of the University of Zurich offers a unique opportunity to analyze pro-social behavior in a naturally occurring situation. It includes the decisions of all students at the University and has therefore many advantages over previous studies. These features can provide new insights about pro-social behavior. In a first step, the decisions of the students are analyzed in a descriptive way, deducing general patterns of giving to the two funds. The data set from the contributions to the two social funds is also used in the three chapters that follow, where special aspects of pro-social behavior are analyzed in-depth.

2 General Pattern of Pro-Social Behavior: Descriptive Analysis

In the descriptive analysis, various aspects of pro-social behavior will be explored empirically. First, the overall level of contributions to the two funds is presented, along with whether people stick to their first decision. Second, the effect of repetition on the willingness to contribute is investigated. Third, framing effects are analyzed. Fourth, I discuss whether identification with the University or a special group in the organization has an impact on giving. And fifth, I consider whether people differ substantially in their pro-social preferences.

2.1 Level of Contribution

The raw data suggest that the students in the sample do not act according to the predictions of the traditional economic model of selfish individuals. A large proportion of the students are prepared to contribute to the funds. Between the years 1998–2002, on average more than 69% of the individuals contributed to at least one of the funds (see table III.2). More than 62% contributed to both funds. In dictator game experiments, the contribution of the subjects is normally much smaller. These differences can be explained by the fact that recipients differ. While in dictator games students share money with another student, in the case of the two social funds the money is earmarked for needy students. Eckel and Grossman (1996a) show in an anonymous dictator game that contributions are much larger if the subjects can give money

to an established charity rather than to another experimental subject who does not need the money urgently.

Table III.2

Contributions to Two Social Funds, University of Zurich

Contributions to …	Absolute	Percent
… both funds (€ 8.1)	113,420	62.9%
… Foreigner Fund only (€ 3.4)	7,389	4.1%
… Loan Fund only (€ 4.7)	4,686	2.6%
… neither of the two funds	54,730	30.4%
Total	180,225	100.00

Data source: University of Zurich, 1998-2002.

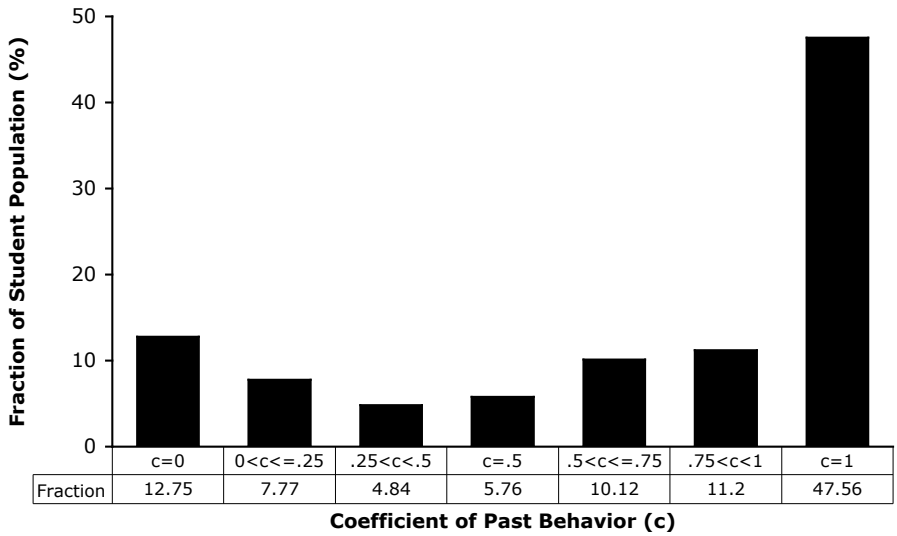
Most of the students either always contribute or never contribute to one of the funds. Results from laboratory experiments show that subjects basically tend to divide into two groups: one group who free-rides all the time and another group of subjects who does not. Figure III.2 shows the distribution of 'types' according to their past behavior in the total student population. The 'coefficient of past behavior' indicates the number of previous decision situations in which the subject decided to contribute. This is captured by a coefficient ranging from 0 to 1. Thus, a coefficient of 0.5 indicates that this particular individual contributed in half of the decision situations in which he or she was involved. Almost 50 percent of the students contributed in all previous decisions to at least one of the funds. Around ten percent never contributed to either of the two funds. The rest fall somewhere in between.[39] The fact that a large proportion of the students always contribute in their previous decisions may be an indicator that students keep on contributing even after several rounds.

The results which show that many people contribute in all their previous decisions and some never contribute can also be explained by the fact that people are heterogeneous in their pro-social preferences. Some people derive high utility from contributing while others would suffer disutility from donating. People at the two ends of this continuum are expected to be less sensitive to minor changes in, for example, the price of donating and therefore do not change their behavior over time. People in between gain only slight utility from contributing. They are therefore expected to be more sensitive to minor changes in the relative prices. In the field experiments in chapters IV and V, it is shown that people who tend toward indifference about contributing react more to a change in the degree of social comparison and the price of giving.

[39] The distribution of types presented may be biased because people differ in the number of decision taken. In figure App.III.1 in the appendix, people are divided after precisely four decisions, which results in five different types. It can again be shown that most students contributed in all of the four decisions.

Figure III.2

Distribution of 'Types'



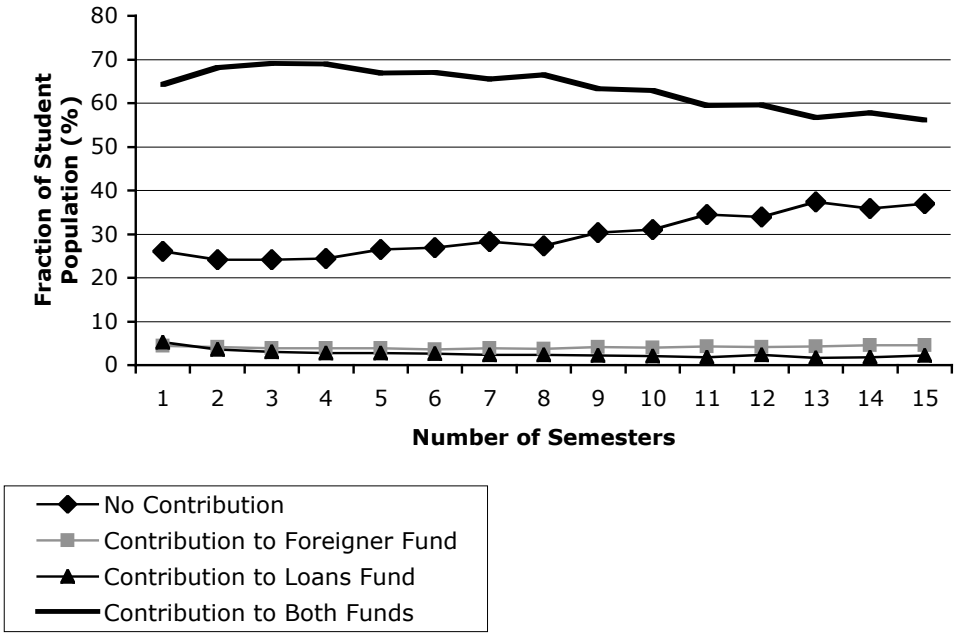
Data Source: University of Zurich, 1998-2002.

2.2 Repetition

As can be noted from the last section, almost half of the students contribute in all their possible decisions. Therefore, one would expect that with repetition, contributions do not decline much. Figure III.3 shows that willingness to give money to the social funds is dependent on the number of semesters the students have studied so far at the University. The pattern of contributions shows that the level of contribution only slightly decreases with repetition of the decision. In the absence of any form of punishment, one would expect that with repetition cooperation decreases considerably, as shown by public goods experiments (e.g. Fehr and Gächter, 2000a). The results of figure III.3 show, however, that even after several rounds, a large number of students act pro-socially in an anonymous decision setting. Even without a punishing mechanism, contributions do not decay to zero with repetition. As the decision is completely anonymous and people decide at home, pro-social behavior seems not to be due to an experimenter effect or to some other sort of direct reciprocal reaction, as mentioned by Hoffman et al. (1996). These authors believe that, because anonymity is not completely guaranteed, this can explain the high level of donation in one of their dictator game experiments. Johannesson and Persson (2000), on the other hand, by increasing social distance between dictator and recipients even more, find evidence of non-reciprocal altruism.

Figure III.3

Contributions Depending on Number of Semesters



Notes: Students are shown up to their 15th semester. Eight semesters, including the exams, is the norm, but 22% of the students study longer.
Data Source: University of Zurich, 1998-2002.

The decision situation appears to have no official punishment mechanism by the other students due to complete anonymity or by the University due to the fact that the contribution of the students does not influence any possible future support from the funds in case of need. However, three important remarks have to be made as to why reciprocity cannot be excluded as a motivational factor and why contribution rates do not decay strongly: (1) feedback about the behavior of others is absent; (2) the decision setting may not be totally anonymous; (3) reciprocity in expectation cannot be excluded. These will each be discussed in turn.

(1) There is no feedback concerning the pro-social behavior of others in this decision situation. Students do not know how the others behaved in the previous periods, so they cannot update their beliefs. Therefore reciprocity cannot be excluded. According to Fischbacher et al. (2001) such updating of beliefs may lead to a decline in cooperation because, with each successive round, students observe what others contributed and react by giving a little bit less. After several rounds, they find themselves contributing next to nothing. However, a feedback mechanism could have evolved endogenously. But comparison with others does not seem to be very important for students; if it really were, a student organization would provide the relevant information. There are many real-life public goods

where no accurate information about the behavior of others is available and contribution does not decline over time (an example is tax paying). In other cases, though, there is perfect feedback of aggregate participation rate and no deterioration in cooperation occurs (one example is voting). Houser and Kurzban (2002) show in their public goods game that the decay in cooperation can be explained by a reduction in confusion and that "it does not seem that cooperation due to social motives decays much with rounds" (p. 1066). It may be that in the concrete situation analyzed here, less confusion is present, reducing the deterioration in cooperation.

(2) The decision situation may not be anonymous in two respects: firstly, other students may apply social pressure. However, table III.3 shows the answers to two questions designed to find out whether the students are aware of the behavior of others and whether they actually talk with each other about the funds. The results indicate that more than three quarters of the students do not tell their friends whether they contributed or not. Three quarters of the students never talk with their peers about the funds. Secondly, although the University does keep accounts of who contributes to the funds separate from the administration of the funds, people may still suspect that the University uses the information about the contribution in some kind of way. As in laboratory experiments, such uncertainty can never be ruled out. However, as the relationship to the University administration is quite anonymous and there are no ambiguous signals about the way the information is handled, the probability that persons are skeptical about anonymity is small.

Table III.3

Knowledge about the Contribution of Others

Question 1: 'Do your friends know about your contribution?'		
	Absolute	Percent
No, they do not know	2568	78.87
Yes, they do know	688	21.13
Total	3256	100.00

Question 2: 'Do you ever talk about the two social funds to your friends?'		
	Absolute	Percent
No, we do not talk	2488	76.34
Yes, we do talk	771	23.66
Total	3259	100.00

Data source: Own survey; University of Zurich, 2000.

(3) Sustaining contributions under anonymity does not exclude reciprocity in expectations ('conditional cooperation'). People may expect others to contribute and react reciprocally to this expectation. Such conditional cooperation may, of course, be due to perceptions of social norms; people indicate how they perceive such norms when asked how many others they expect are contributing. As discussed in the next chapter, however, causality may be the other way round. Given that students do not know for certain what other people do, and that they do not seem particularly interested in the behavior of other people (as they rarely talk with their peers about the two social funds), some doubt is cast on the notion that the causal relation between expectations and one's own behavior comes from any concrete knowledge about the number of overall contributions relative to one's own contribution. A more complete discussion of conditional cooperation as a motive for contributing to the funds is provided in chapter IV.

To summarize, in the natural decision setting under analysis, pro-social behavior does not deteriorate dramatically with repetition. This behavioral pattern, occurring as it does in an anonymous situation, does not correspond to many laboratory public good games. As students' knowledge about the behavior of other students is very limited, this pattern may be due to a lack of feedback about others' behavior. Another possible explanation for the differences in repetitive behavior between field and laboratory settings may be identification with the group. As discussed in the next section, identification with the University may increase with repeated registration, an effect which might stabilize contribution to a social fund at the University.

2.3 Influence of Institutional Conditions on Pro-Social Behavior

Pro-social behavior may be dependent on institutional conditions (see the discussion in chapter II). Two sorts of particular environmental conditions may be crucial for acquiring contributions to the two social funds and are here analyzed empirically: (1) the framing effects of different ways of asking and (2) group identifications. Such context-dependent pro-social behavior has been labeled 'institutional framing' by Isaac et al. (1991). Bolton et al. (1998) analyze how much context influences behavior in dictator games. While they could not detect any experimenter effect, they found that the context of the decision (as given by differences in the written instructions) had a very large impact. This concept of context dependent pro-social behavior goes beyond theories of reciprocity and pure altruism.

2.3.1 The Way of Asking

A crucial institutional feature supporting pro-social behavior is being asked to do so. Moreover, much depends on how one is asked. Different ways of framing the same question institutionally can change the prevalence of pro-social behavior dramatically (for framing effects see e.g. Lindenberg, 1992; Sonnemans et al., 1998; Elliott and Hayward, 1998; Cookson, 2000).

At the University of Zurich, an exogenous variation of the institutional conditions allows to test the effect on pro-social behavior. Due to a restructuring of the administration, the University of Zurich changed the official letter for renewing students' registration for the winter semester of 1998. After this semester, the administration was able to handle students' decisions electronically. The students are now asked to contribute in the following way (see section 1.1 for the decision setting): they have to tick boxes to decide if they want to donate money to one or the other fund, to both or to neither of the funds. One month later, they receive an invoice with the compulsory tuition fee plus the chosen amount for the social funds. Before the winter semester of 1998, students received two invoices and had to choose between the two; one with the amount of the compulsory tuition fee on it, and the other with the amount of the tuition fee *plus* the amount due for contributions to both funds.

Standard economic reasoning would consider the two decisions identical because the underlying decision to be taken is the same: one has to choose whether to contribute money to the two funds or not. The prediction is also identical: a homo oeconomicus will *not* donate money in either of the two anonymous decision settings. However, even for non-traditional explanations of cooperative behavior (e.g. reciprocity and pure altruism), the different settings should not affect the behavior of the subjects. If, for example, cooperation is only conditional on the behavior of others, no behavioral difference should be observed in the two settings. If framing affects pro-social behavior in the situation analyzed, theories on pro-social behavior must go *beyond* assumptions of reciprocity or pure altruism because these theories were unable to explain such a result.[40]

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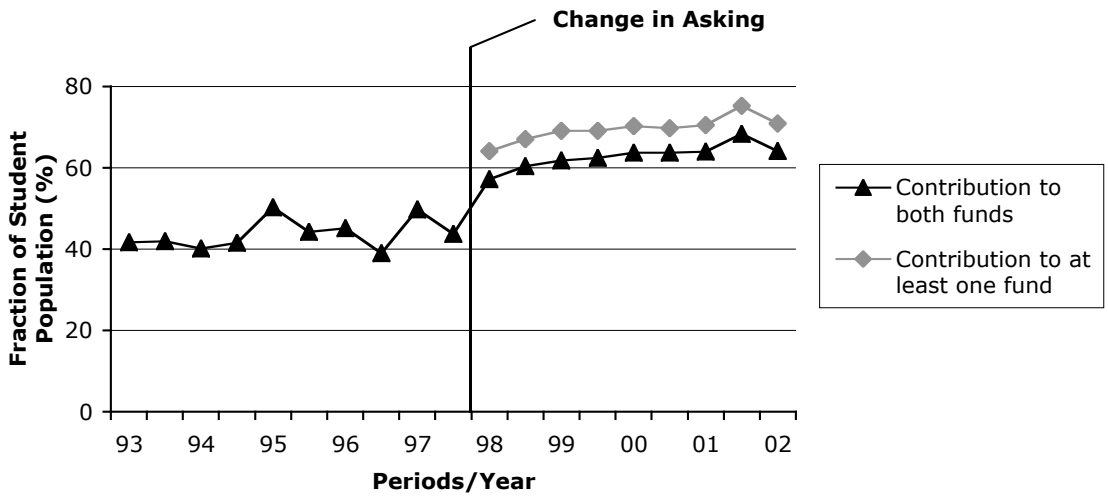
[40] Andreoni (1992) presents evidence that positive framing leads to more cooperation in a public good experiment than negative framing of the same decision. He explains this difference in the light of the 'warm glow' effect: 'it must be that people enjoy doing a good deed more than they enjoy not doing a bad deed' (p. 11).

Figure III.4

Effect of Being Asked in Different Ways



Data source: University of Zurich, 1993-2002.

Figure III.4 shows the effect of the exogenous change in the institutional setting on pro-social behavior. After a change in the way of asking (in the summer semester of 1998), the percentage of people contributing to the two social funds increased from an average of 44% to 62%. The difference is statistically significant (t-value = 11.1, $p<0.001$). Moreover, in the new system, the students can also opt for only one of the funds, so that the percentage of people who contribute to at least one of the funds saw an even bigger increase. The huge behavioral change due to the framing of the question supports the notion that the institutional condition is crucially important for pro-social behavior. However, the motivational basis for this dramatic framing effect is unclear. Two possible explanations may be possible.

(1) The request process may be perceived as more or less fair, which might increase or decrease the willingness to behave pro-socially. In the new request scheme, students are explicitly asked to contribute and can also opt to contribute to only one of the funds. This explicit asking may be perceived as a fairer procedure compared to the situation where students just received two invoices. A number of studies show that the perceived fairness of various processes can have effects on pro-social behavior. For example, employees who perceive procedures at work to be fair show more extra-role behavior (e.g. Organ and Ryan, 1995). Frey et al. (2003) review much of the literature on fair procedures and whether procedures are valued as such.

(2) Another possible explanation for this result may be that people have 'self-control' problems. 'Self-control' problems can be understood according to O'Donoghue and Rabin (1999) and Laibson (1997), who enhanced a theory by Strotz (1956) of hyperbolic discounting, that people discount costs of events in the far distant future at a higher rate than the same events in the near future. In the decision setting presented above, the costs are the same and have to be paid at almost the same time of the year, but in one setting, the decision to contribute occurs long before the actual payment. Therefore the psychological costs of deciding today and paying in a month's time are lower than deciding today and paying today.

2.3.2 Group Identification

A second important aspect that influences pro-social behavior is identification with (1) an organization or (2) a specific group. As has been shown in other studies, especially in studies concerning alumni giving to universities, attachment to an organization is an important factor in explaining pro-social behavior (Clotfelter, 2003; Mael and Ashforth, 1992). In the case of the contribution to the two social funds at the University of Zurich, changes in the institutional conditions affecting the students' identification with the University should explain some of the variation in giving behavior.

(1) *Identification with the University*. One such change in the environmental and institutional conditions takes place at the beginning and the end of a student's university life. In both periods, students' actual attendance at the University is lower than in the periods in between. Before taking up their studies (at the very beginning) students obviously have not attended the University at all; at the end of their studies, students no longer attend classes, but prepare for their exams over an extended period of time (more than half a year in the Swiss university system) and therefore attend the University only sporadically. The strongest identification with one's University should exist when students regularly attend courses and feel themselves to be a part of the student body and their *alma mater*. As a consequence, students are expected to contribute significantly less to the social funds at the beginning and end of their studies. As can be seen in figure III.3, the donations by freshmen increases after they have spent one semester at the University. While 73%of the freshmen contribute to at least one fund, the contribution rate increases to 76% in the second semester ($t=4.68$; $p<0.001$). A similar pattern can be found for people in their last semester. Contribution rates drop to 61% in the last semester, compared to 63% in the next to last semester ($t=2.36$; $p<0.05$) and 64% in the semester before that ($t=4.70$;

p<0.001). The descriptive analysis seems to support the positive effect that identification with an organization has on pro-social behavior.

(2) *Group identification*. Another effect of identification can be analyzed for the foreigner fund and whether foreigners are more likely to contribute to this fund. Table III.4 shows the descriptive statistics for the contributions of foreigners to the social funds. Foreign students, if they contribute at all, mainly tend to support other foreigners. This pattern of pro-social behavior can be interpreted in the light of the importance of identification for giving. Foreigners identify more with other foreigners. This evidence is consistent with various studies that find that group identity explains a large degree of the variance in pro-social behavior (Simon, 1993; Dawes and Thaler, 1988; Akerlof and Kranton, 2000). At the University, this group identity is not achieved through discussion, but evolves as an attachment to an anonymous group. This result corresponds to observations that homogeneous communities are more likely to redistribute money from the wealthy to the poor (Alesina and La Ferrara, 2000; Luttmer, 2001).

The empirical results in this section show that pro-social behavior depends on institutional conditions. Most of all, the way one is asked to contribute to a public good is of great importance, even in the absence of personal contact. Moreover, the results support the crucial effect of identification and identity on giving behavior.

Table III.4

Contribution of Swiss and Foreigners to the Two Social Funds

Contribution to …	Swiss	Foreigners
… both Funds	64.31% (102,336)	52.55% (11,084)
… Foreigner Fund	3.39% (5,388)	9.49% (2,001)
… Loan Fund	2.74% (4,357)	1.56% (329)
… neither of the Funds	29.57% (47,052)	36.40% (7,678)
Total	100% (159,133)	100% (21,092)

Notes: Pearson Chi^2 (3)= 2500.0, p<0.01; number of observations in parentheses.
Data source: University of Zurich, 1998-2002.

2.4 Heterogeneity in Pro-Social Behavior

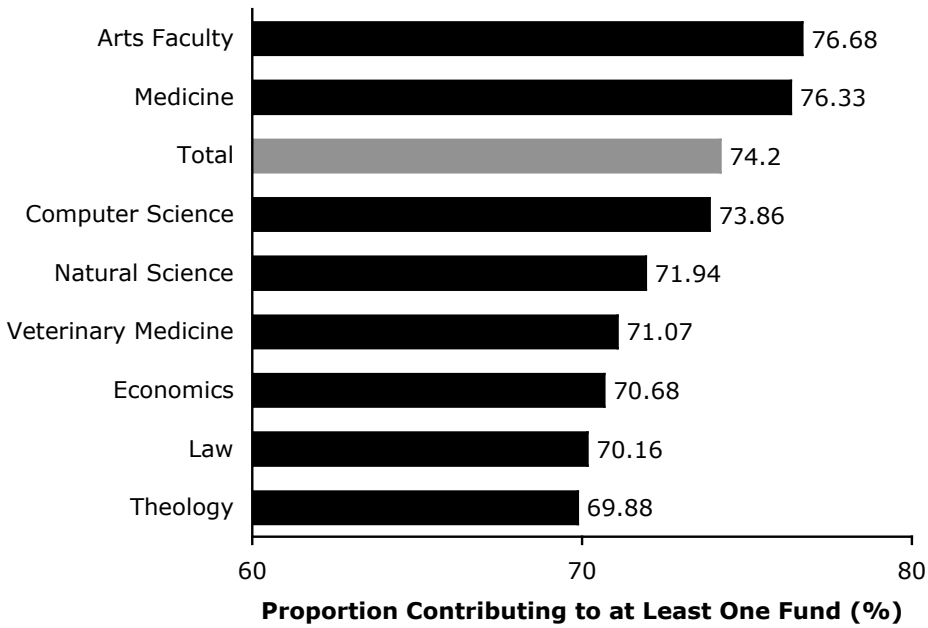
People seem to differ in their pro-social preferences, which leads to different behavior. Some of them free-ride right from the beginning of the game and thus behave according to the standard economic predictions, while others deviate from this prediction substantially and act in a pro-social way. Looking at selection effects may test this notion about different ‘types’ of

people. People with similar preferences may select similar subjects at the University. If this is the case, we should observe that the distribution of selfish types is not random, but systematic.[41] To test this hypothesis, figure III.5 looks at the first decision students make to contribute to the two funds at the University. At this time, students have not yet attended any lectures at the University, so any effects resulting from the influence of University training can be excluded. In addition, any effect arising from group interaction is absent due to the fact that students have never met each other before they decide.

While almost 77 percent of arts students contribute in their first decision to at least one of the funds, only 70 percent of law students do so. Students of economics seem to be a selection of less pro-socially inclined individuals. In their first decision future economists have a lower contribution rate by nearly 4 percentage points compared to the average. The difference between the students of the various disciplines is remarkable, not least because people go through a very similar high school system which gives every student basically the same education. The chosen discipline of study, therefore, partially reflects the type of students.

Figure III.5

Contribution Rates of Freshmen in Various Disciplines



Data Source: University of Zurich, 1998-2002.

[41] Similarly, Ockenfels and Weimann (1999) compare the preferences of East and West Germans in laboratory experiments and find differences in their cooperative behavior. Cadsby and Maynes (1998) compared the behavior of nurses with economics students in an experimental public good game.

The result that people group themselves into the various disciplines according to their pro-social preferences will be further studied in chapter VI. In terms of economics students, one aspect will be central to the analysis: if behavioral differences between economists and non-economists appear in the first semester, then do these differences change during their studies. Looking at the overall contribution rate for the various disciplines shows many changes after the first semester (see figure App.III.2 in the appendix for a respective figure).

3 Multivariate Analysis: An Excursion into Econometrics

The descriptive analysis presented above reveals interesting patterns of pro-social behavior, such as the fact that contributions to the funds do not fall off as dramatically with repetition (number of semesters) as found in laboratory experiments. The empirical results, however, have to be interpreted with much care because the effects presented can be systematically influenced by third factors. The interpretation of a correlation may then be wrong. For example, as the number of semester increases, students also become older. It may be that older students are more willing to contribute to the two funds. In this case, age might be the explanation why contributions do not decay much, compared to laboratory experiments where the ten rounds are played in the same afternoon. If the age structure were not taken into consideration, it would be incautious to conclude that contributions do not erode with repetition. Two problems in particular arise if one relies only on descriptive analysis. These problems can be solved using multivariate regression models. Because these models are used throughout the thesis, in this section I will discuss how the two problems can be tackled and I will present the two econometric models mainly used here: probit and conditional logit models. The multivariate analyses are explained using the contributions to the two social funds as an example. The next section is therefore the first step to complementing the results of the descriptive analysis.

3.1 Testing for Third Factors: Probit Regressions

In the analytic case of an independent variable affecting a dependent variable, a third variable may influence both variables simultaneously and systematically. Without taking this third variable into account, the effect cannot properly be interpreted. Take for example, the result that students of the various disciplines differ substantially in their willingness to contribute to the two funds in their first decision. It is possible that students of the various disciplines differ systematically with regard to other characteristics, such as sex or age, that correlate with

giving behavior. This may explain why economics students are less willing to contribute: they are mostly male. In a multivariate regression analysis, all these factors can be taken into account and kept constant.

In the empirical analysis of contributions to the two social funds, one particular dichotomous dependent variable appears which takes the value 1 if students contribute to at least one of the two funds and 0 if students do not contribute at all. The probit model (see Amemiya, 1981) takes into account that the dependent variable is dichotomous. In order to control whether for example economists give less because they are male, the following model has to be estimated:

$$\text{Probability (at least one fund = 1)} = \text{Prob}(\beta_1+\beta_2*\mathbf{X} + \beta_3*\mathbf{Y} + \beta_4*\mathbf{Z} + \varepsilon>0)$$

$$= 1-\Phi(-\beta_1-\beta_2*\mathbf{X} - \beta_3*\mathbf{Y} - \beta_4*\mathbf{Z})$$

where:
- $\mathbf{X}$ vector of faculties,
- $\mathbf{Y}$ vector of demographical variables,
- $\mathbf{Z}$ vector of additional control variables,
- $\beta_{1,2,3,4}$ vector of the estimated coefficients,
- ε a normally distributed error term,
- $\Phi(\ )$ Standard normal cumulative distribution function.

The log-likelihood-function can therefore be written in the following manner:

$$\ln L = \sum_{\text{i, who contribute}} \ln\left(1-\Phi(-x'_i b)\right) + \sum_{\text{i, who do not contribute}} \ln \Phi(-x'_i b)$$

The coefficients in a probit model are difficult to interpret. Therefore, marginal effects are computed which indicate how the probability of contributing changes compared to the reference group for dummy variables and how it changes if the independent variables change one unit for all continuous variables. The marginal effects are calculated in the following way:

$$b_i = \frac{\partial \Phi(xb)}{\partial x_i}\Big|_{x=\bar{x}} = \phi(\bar{x}b)b_i$$

In table III.5 a probit model is presented for the first decision to contribute. As *the* first decision is by definition unique, students are represented only once in the estimations. The decisions of 13,685 freshmen are analyzed from 1998 until 2002. Apart from the variables for the disciplines, a number of variables control for age, sex, nationality and marital status. A variable for the time period controls for the respective year.

The results in table III.5 support the hypothesis that students differ in their social preferences and select along these preferences into different disciplines. As in the descriptive analysis, the differences between the disciplines remain. For example, the willingness of economists to contribute to at least one of the funds is *ceteris paribu*s 8 percentage points lower than the reference group. The difference is statistically significant on the 99-% level. The control variables show that *age* has only a minor effect on the first decision. For people below 40, age cannot explain contributions to the two funds. *Women* tend to contribute substantially less in the first semester than men. The probability of women contributing is almost 5 percentage points lower than for men. *Nationality* and *marital status* have no statistically significant influence on the contribution to the two funds. The regression in table III.5 is limited to the first semester and is therefore a cross-sectional analysis. To illustrate the second empirical problem evolving in this thesis, the next section looks at overall contributions to the two social funds.

Table III.5

Contribution of Students of Different Faculties in the First Semester

Dichotomous dependent variable: 'Contribution to at least one fund' = 1, probit regression

Variable	Coefficient	Z-value	Marginal effect
Arts Faculty	Reference group		
Medicine	-0.012	-0.26	0.3%
Veterinary Medicine	-0.149*	-2.14	-5.0%
Natural Science	-0.175**	-4.29	-5.9%
Computer Science	-0.189*	-3.16	-6.4%
Theology	-0.206	-1.40	-7.0%
Law	-0.208**	-6.24	-7.0%
Economics	-0.240**	-6.29	-8.1%
Control variables			
Age 26-30	0.016	0.30	0.5%
Age 31-35	0.106	1.26	0.3%
Age 36-40	0.195	1.57	5.9%
Aged over 40	0.304*	2.14	8.7%
Gender (female=1)	-0.154**	-6.24	-4.9%
Nationality (foreigner=1)	-0.0003	-0.01	-0.0%
Married (=1)	0.017	0.19	0.6%
Constant	-0.515**	15.34	
Period dummies	Yes		
N	13,685		
Log Likelihood	-7696.493		

Notes: Reference group consists of 'Arts faculty', 'aged below 26', 'male', 'unmarried', 'Swiss', 'semester 1998/99'.
Level of significance: * 0.01<p<0.05, ** p<0.01.
Data source: University of Zurich, 1998-2002.

3.2 Unobservable Individual Heterogeneity: Conditional Logit Model with Individual Fixed-Effects

In panel I of table III.6 another probit regression is presented with the decisions of all students. The decisions are pooled, which leads to 156,841 observations.[42] The results from identification with the University are supported in a multivariate regression; the probability that a first-semester student will contribute money is 1.8 percentage points lower than those in the following semesters (the reference period is the *basic* study). This effect is statistically significant at the 99%-level. The effect on contributing by students in the last semester is also shown in table III.6. The variable for the last semester takes the value 1 if a student is in his or her last semester and 0 otherwise. The probability of contributing to at least one fund decreases by 7.0 percentage points in the last semester compared to the preceding periods. The two behavioral regularities observed – that students tend to contribute less before they start their studies and at the very end of their studies – is consistent with a changing identification with the University as an organization.

A problem with probit models is constituted by unobservable time-invariant heterogeneity. Such factors may systematically influence the dependent and independent variables of a probit model. If these factors are not taken into account, the coefficients of a probit model can lead to false conclusions. For example, Ph.D. students constitute a selection of people which differ from first-degree students in terms which might be important for pro-social behavior. This is most obvious in the case of business administration: people who enter the Ph.D. study probably differ from students who enter a consulting firm directly after their master's degree. It could well be that the former are more pro-socially inclined. To exclude the possibility that unobservable differences between students systematically influence the results, one should observe a future Ph.D. student during his/her first degree and analyze whether entering the Ph.D. study has influenced his or her pro-social behavior. Conditional logit models with individual fixed-effects take this time-invariant unobservable heterogeneity into account (see Greene, 1997: 896-901).

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[42] The number of observations in the probit model deviates from the total number of observations in the data set because the variable *last semester* can only be constructed up to the next-to-last semester. Therefore, the observations for period 9 could not be used in the presented specification.

The function of individual heterogeneity can be written:

$$Y_{it} = f\left(X_{it}\beta + \alpha_i + \varepsilon_{it}\right)$$

where Y is an action of individual i at time t. This action (e.g. contributing to at least one fund) is a function of various variables X and a time-invariant individual constant term α. The error term is ε. This estimation for a dichotomous dependent variable Y cannot be made in a probit model, but in a logit model. It appears as:

$$\text{Prob}\ (y_{it} = \text{contribute}) = \frac{e^{\alpha_i + \mathbf{b'x}_{it}}}{1 + e^{\alpha_i + \mathbf{b'x}_{it}}}$$

In order to estimate this fixed-effects logit function, the following conditional likelihood function is used:

$$L^c = \prod_{i=1}^{n} \text{Prob}\left(Y_{i1} = y_{i1}, Y_{i2} = y_{i2}, ..., Y_{iT} = y_{iT} \left| \sum_{t=1}^{T} y_{it} \right.\right)$$

For people who change their behavior y at least once, probabilities can be received where the individual constant term a_i drops out of the likelihood function (see Greene, 1997: 900, for details). The intuition behind this is that if one knows how often people contributed (y=1), one can use this as a condition for calculating the coefficient β. The individual constant term a_i determines the overall proportions of 1s (how often people contributed) in the data. The other variables ($\boldsymbol{X}$s) and the coefficients (βs) determine *when* those contributions occur. The estimations of β are then independent of the individual heterogeneity a_i.

The conditional logit model applies only to people who have a variation in the dichotomous dependent variable, i.e. who have changed their behavior at least once. From those who did not change their behavior, nothing can be learnt in such a framework. This explains why in panel II of table III.6, the number of observations dropped to 60,522. In contrast to the probit model, the model with personal fixed-effects uses the panel structure of a data set and estimates the effect of a change in the independent variable on the dependent variable *within* subjects. The model takes a different constant term for every individual, which explains why no constant term is computed for panel II. For the conditional logit model it is also not possible to estimate marginal effects.

Table III.6

Contribution to the Social Funds

Dichotomous dependent variable: 'Contribution to at least one fund' = 1

	Panel I Probit regression			Panel II Conditional logit with fixed-effects	
Variable	Coefficient	Z-value	Marginal effect	Coefficient	Z-value
Freshmen	-0.051**	-3.15	-1.8%	-0.276**	-6.07
Basic study	Reference group				
Main phase	0.122**	12.96	4.2%	0.156**	3.67
Ph.D.	0.016	1.18	0.6%	-0.047	0.52
Last semester	-0.193**	-16.89	-7.0%	-0.211**	-5.49
Number of semesters	-0.041**	-26.90	-1.4%	-0.171**	-4.80
(Number of semesters)^2	0.001**	15.98	0.02%	0.002**	4.73
Control variables					
Age 26-30	0.008	0.84	0.2%	-0.154**	-3.41
Age 31-35	0.173**	12.46	5.8%	-0.039	-0.47
Age 36-40	0.314**	17.25	10.1%	-0.033	-0.24
Age over 40	0.514**	25.32	15.4%	0.062	0.30
Gender (female=1)	-0.017*	-2.52	-0.6%		
Nationality (foreigner=1)	-0.118**	-11.40	-4.2%		
Married (=1)	0.050**	4.15	1.7%	0.059	0.58
Period 2 (summer semester 1999)	0.083**	6.15	2.9%	0.358**	7.28
Period 3	0.142**	10.83	4.8%	0.563**	7.52
Period 4	0.142**	10.56	4.8%	0.607**	5.70
Period 5	0.178**	13.55	6.0%	0.732**	5.33
Period 6	0.165**	12.28	5.6%	0.752**	4.40
Period 7	0.184**	14.17	6.2%	0.837**	4.13
Period 8	0.322**	23.78	10.4%	1.424**	6.02
Constant	0.596**	44.12			
N	156,841			60,522	
Log Likelihood	-94596.321			-22691.8459	
				LR chi^2(18) = 481.56	

Notes: Reference group consists of 'basic study', 'aged below 26', 'male', 'Swiss', 'Period 1 (semester 1998/99)'.
Level of significance: * 0.01<p<0.05, ** p<0.01.
Data source: University of Zurich, 1998-2002.

The conditional logit model with individual fixed-effects supports the view that people contribute less in the first and the last semester at the University. The effects are statistically significant at the 99%-level. This is consistent with the notion that identification is important for the behavior of students. The statistically significant effect of entering the main stage is also consistent with higher identification with the University.

The control variables in table III.6 show the expected results. As could already be seen in the descriptive statistics (see figure III.3), the *Number of semesters* attended decreases the probability of a contribution to the funds, but not dramatically so. *Gender* has an effect on giving

behavior. The probability that women will contribute to the funds is 0.6 percentage points lower than it is for men in the probit model. This result contradicts previous results for behavioral differences between women and men (Eckel and Grossman, 1997; Ortmann and Tichy, 1999). The fact that the amount of money involved is relatively low may explain these differences, as men are found to be more pro-socially active when the price is low, while women tend to be more pro-socially active when prices are relatively high (Andreoni and Vesterlund, 2001). The results of the field experiment presented in chapter V, however, do not support this statement. The probability that *foreign* students will contribute to the social funds is smaller than for Swiss students. *Married* students are more generous than their single colleagues; however, the effect is not statistically significant in a fixed-effects model. Marriage itself does not make one more generous, but married students are a special selection.[43] Over time, the willingness to contribute increases, as indicated by the period dummies.

In sum, the two multivariate models presented help to overcome problems with the descriptive analysis and make the interpretation of correlations more accurate. In the following empirical chapters, both models will be used to eliminate the systematic influence of third factors as well as the bias of unobservable heterogeneity on results. However, a third problem still remains: the question of causality. The multivariate regressions cannot be conclusive about causality. In the empirical part, exogenous interventions in a field experiment and a natural experiment will address the causality problem. The experimental designs will be discussed in the relevant chapters.

4 Concluding Remarks

This chapter has investigated the general pattern of pro-social behavior by empirically analyzing contributions to two social funds at the University of Zurich. After evaluating the advantages and disadvantages of the data set, a descriptive analysis was presented which was complemented with a section on multivariate regression models.

The behavior of the students is consistent with previous research results showing that people deviate from the self-interest hypothesis. A substantial number of students are prepared to act

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[43] For a detailed discussion about selection effect and marriage and how these problems can be answered by using panel data, see Stutzer and Frey (2003c).

in a pro-social manner in a naturally occurring and anonymous decision situation. The descriptive analysis furthermore provided three key insights about the conditions for pro-social behavior in a natural laboratory. The findings allow some initial speculations about the relative importance of the theories presented in chapter II. All three findings of the descriptive analysis will be extended with further empirical investigations in the following three chapters.

(1) Even after several rounds, a large number of students are willing to behave pro-socially. The decay in contribution is therefore not as severe as that found in previous public goods games. A possible reason may be that the decision situation differs from a pure public good game in two respects. Firstly, the interdependence of pay-offs is not as salient as in laboratory experiments, because many more people are involved and the utility people get from the two funds is indirect; secondly, students receive no feedback about the behavior of others. This may be important in explaining why pro-social behavior is stable over time. The descriptive analysis is silent about the question of how people would react to such feedback. It is possible that people would behave reciprocally, i.e. that people would increase their contributions when informed that many others were doing so as well. It is equally possible that if people realized that many others already supported the charity, they would see no need to continue contributing themselves. In the next chapter, the question of whether people's pro-social behavior is dependent on the behavior of others will be analyzed in a field experiment.

(2) Institutional conditions are crucially important for pro-social behavior. The contributions to the two funds have been found to be very sensitive to framing effects. The design of the way people are asked to contribute is of great importance, in this case resulting in a huge increase in contributions due to a small change in the manner of request. This increase cannot be explained by theories of altruism or reciprocity. However, the mechanisms underlying the effect of the institutional condition are far from being conclusively explained. Nonetheless, the fact alone that institutional conditions are of great importance when looking at the magnitudes legitimizes the claim that much more effort should be invested in understanding the influence of institutional conditions on pro-social behavior.

    As institutions often influence the relative prices of a decision setting, chapter V investigates the behavioral reaction to a matching mechanism. In the field experiment undertaken, the costs to contribute to the two funds remain the same but the contributions are matched by an anonymous donor. The benefit of an individual donation, therefore, is changed.

(3) The analysis of the contribution rates of students from different faculties shows huge differences. One possible explanation may be that people have heterogeneous pro-social preferences and select themselves into different faculties. As the economics faculty in particular is often accused of eroding the citizenship behavior of its students by stressing the self-interest hypothesis too much, chapter VI analyzes in-depth the relationship between (an economics) education and pro-social behavior.

Chapter IV

Social Comparisons and Pro-Social Behavior: A Field Experiment

In deciding whether to cooperate in a social dilemma situation, people may care about the pro-social behavior of the other persons involved. People may be willing to contribute to a public good if they know that other people are doing so as well. But if the average individual of a group does not behave pro-socially, a single member of this group may also not be prepared to contribute. This relationship between social comparisons and pro-social behavior, so-called conditional cooperation, is not trivial because it stands in contrast to standard economic theory and also to pure altruism theories. If people behave according to pure altruism theories, they reduce their own contribution when informed that the others are already contributing.

Testing conditional cooperation faces various difficulties. A positive correlation between an individual's behavior and the average group behavior can have at least two potential origins: either the reference group's behavior influences the behavior of the individual or the group is constituted by individuals of similar (unobservable) characteristics. Group behavior in the latter case does not influence individual behavior, but rather the similar characteristics are responsible for the positive correlation.[44] Further, it is not sufficient to compare one's expectations about the behavior of others with one's own behavior. Even if the correlation between expectations and one's own behavior is positive, causality is not clear. Expectations about others do not necessarily trigger behavior; sometimes behavior influences expectations. Such a 'false consensus' effect (e.g. Ross et al., 1977) can occur because cooperative people may model their expectations about other peoples' behavior on their own behavior, or they may want to justify their own behavior.

The challenges to measuring conditional cooperation can be addressed if beliefs about the behavior of the reference group can be experimentally manipulated. Only a few studies,

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[44] For a collection of problems in identifying social interaction effects, see Manski (1993; 2000) and Glaeser and Scheinkman (2001).

however, explicitly test conditional cooperation in laboratory experiments (see chapter II for a survey of the results). This chapter presents the first study to test 'conditional cooperation' for charitable giving outside the laboratory.

After the presentation of the design of the field experiment, in section 2 the behavioral hypothesis is derived based on the theoretical consideration in chapter II. In section 3 the effect of the field experiment is analyzed and the results presented. In section 4 conclusions are drawn for economic theory and policy.

1 Design of Field Experiment

The field experiment was implemented in the naturally occurring decision situation at the University of Zurich. In the experimental intervention, 2500 subjects of the student population were selected at random and provided with additional information about the two funds. With the official letter for renewing registration and deciding whether to contribute to the two funds (for the winter semester 2002/2003), the administration supplied the students selected with differing information about the behavior of other students. The sheet of paper that the various treatment groups received differed only with respect to the exact information given (see figure App.IV.1 in the appendix for a sample information sheet). Due to the 'institutional difference' that freshmen have to pick up the registration form at the counter of the administration office, only those students who have already registered and therefore decided at least once in the past are included in the treatment groups. All other non-freshmen constitute the control group.[45] As some students decided not to renew their registration, the decisions of the remaining 2185 subjects in the field experiment could be observed.

The main part of the field experiment provides the students with information about the behavior of others. 1000 students were provided with the information that a relatively *high* percentage of the student population (64%) had contributed to the two funds in the past (Treatment *'High'*), and another 1000 students were provided with the information that a relatively *low* percentage (46%) had contributed to the two social funds (Treatment *'Low'*). No deception was used; the information is based on real contribution rates, but refers to different time periods. The higher contribution rate applies to the winter term 01/02. The

[45] Subjects of the field experiment on matching donations (see chapter V) are also excluded from the control group. The results are, however, not sensitive to the inclusion of these subjects.

lower contribution rate indicates the average over the last ten years.[46] As some of the subjects did not renew their registration, just under 1000 subjects in each treatment were observed.

In addition to these two basic treatments, an 'expectation' treatment was included in the experiment. For an additional group of 500 students, the expectations were elicited about the behavior of others by asking them to guess how many other students (as a percentage of the total student population) contributed to *both* of the funds. The students could return the sheet indicating their expectations free of charge by putting it into the official envelope provided by the University administration. There were monetary incentives for the students to give their truly best guess: the estimate closest to the real contribution rate earned a voucher for music or books valued at CHF 100 (about € 65), and there was a cinema voucher valued at CHF 20 (about € 13) for the five next best guesses. From the eight students who guessed the correct amount (67 percent) the six winners of the vouchers were selected randomly. Of the 431 students in this treatment who decided to renew their registration, 250 made guesses. This constitutes a return rate of 58.0 percent, which is high for a 'questionnaire'. People who contribute to the funds are more likely to return the sheet. However, the selection effect is only a minor problem as the level of contribution is not of interest in this chapter, but rather the correlation between expectations about others' behavior and one's own behavior. The assumption is made that the correlation also holds for people who did not make any guess.

Table IV.1

Summary Statistics for Winter Term 2002/03

Personal characteristics	Control group	Treatment 'High'	Treatment 'Low'	Treatment 'Expectation'
Observations	16,957	878	876	250
Number of semesters	11.564 (8.338)	11.530 (7.973)	11.406 (8.289)	10.032 (7.124)
Age	28.228 (7.289)	27.698 (6.819)	27.887 (6.787)	26.88 (6.537)
Gender (=Female)	51.6%	49.3%	51.6%	52.0%
Coefficient of past behavior	0.732 (0.358)	0.738 (0.358)	0.748 (0.353)	0.746 (0.365)

Notes: Standard deviations in parentheses.
Source: Own experiment and data provided by the accounting department of the University of Zurich.

[46] The different time periods were indicated on the information sheets by stating that either "…% of the students contributed in the last semester" or "… in the last semesters."

Table IV.1 shows the summary statistics for the control group and the treatment group. As the assignment was random, no significant differences emerged between the characteristics of subjects in the treatment group 'High' and 'Low' and the rest of the student population. People who made guesses about the behavior of others are slightly younger than the control group.

Students decide anonymously at home about whether to contribute to the two social funds, but with different information about other students' behavior at their disposal. The analysis concentrates on contributions to at least one of the funds, although students have to decide whether or not to give to two different funds. Whether people contribute to at least one fund or not is used as a dependent variable, firstly because most students contribute either to both funds or do not contribute at all (see chapter III); secondly because the results do not change when other dependent variables are included; and thirdly because it constitutes the lower limit of contribution.

The design of the field experiment has two clear advantages over previous studies:

(1) For at least two decades, laboratory experiments have challenged the standard economic assumption. While experimental research leads to many insights about the basics of human behavior, it is still unclear exactly how these results can be generalized outside the laboratory situation. Field experiments aim to narrow this gap by looking at naturally occurring decision settings, while still controlling for relevant variables.

(2) Due to the panel structure of the data set, pro-social preferences, as revealed by past behavior can be included in the analysis. This makes it possible to identify how different 'types' of people react to social comparison. To analyze such a question with revealed behavior has advantages over questionnaire-based approaches.

2 Behavioral Hypothesis

According to the theory of conditional cooperation, social comparison in this field situation should lead to higher contribution rates when students are presented with the information that many others have contributed. This prediction is not trivial: if students were to behave according to pure altruism theories (e.g. Clotfelter, 1997: 34-35; Croson, 1998), they would reduce their own contribution when informed that other students are already contributing.

The hypothesis to be tested in this chapter predicts that people react positively to the behavior of others. No one likes being the only one who contributes to a good cause and no one likes being the 'sucker' who is being 'free-ridden' by others. The most distinctive prediction of such a theory is that individual *i*'s probability of contribution increases when the percentage of individuals *j* (j=1, …, n; j≠i) who contribute increases within a given group.

> *CONDITIONAL COOPERATION HYPOTHESIS*: People's pro-social behavior is conditional on the behavior of others. The individual behavior varies positively with the average behavior in the group. Therefore, the probability of subjects contributing to the social funds in treatment *'High'* is expected to be greater than subjects in treatment *'Low'*.
>
> *ALTRUISM HYPOTHESIS*: Altruists will free-ride on the contribution of others. Therefore the probability of subjects contributing in treatment *'High'* is expected to be lower than subjects in treatment *'Low'*.

The conditional cooperation hypothesis is based on a broad notion of social comparison (for a detailed discussion, see chapter II). The idea that the more others contribute, the more one gives, may be based on various motivational reasons: firstly, people may want to behave in an way appropriate to conforming to a social norm; secondly, people may have some sort of fairness preferences such as inequity aversion or a norm of reciprocity; or thirdly, contributions by others may serve as a signal for the quality of the public good, or for the organization which provides the good in the end (e.g. a charity).

People may be heterogeneous in their reaction to social comparison. If this is the case, two different sorts of heterogeneity may be important for the analysis of the results:

(1) Only certain 'types' of people are sensitive to the behavior of others. While some persons vary their behavior according to the average behavior in the group, others are not strongly affected by the behavior of others. Glaeser et al. (1996) show in their study of social interaction effects on criminal behavior that some people are not influenced by the behavior of others, the so-called 'fixed agents'. If people have strong preferences for contributing or not to contributing to a good cause, social interaction is unimportant, as opposed to people who do not have such a strong preference either way. This reasoning compares with results from laboratory experiments where a substantial number of the subjects behave completely selfishly, while others show some sort of pro-social preferences.

(2) An alternative form of heterogeneity assumes that everybody reacts to the behavior of others, but people are heterogeneous with respect to the threshold at which they alter their own behavior. Whereas certain people will begin to cooperate when they realize that a small minority does so, others only cooperate when they know that a large majority is already involved. As the experimental intervention induces beliefs about contribution rates of 46 and 64 percentages, only people who have a threshold in between these boundaries are expected to react to the experimental intervention.

Both aspects of heterogeneity lead to the expectation that only a small fraction of people will react to the experimental intervention. And although the 'types' are randomly distributed over the two treatment groups, it is important to control for unobservable heterogeneity in order to isolate the effect of social comparison.

In the following section, the hypotheses are tested in four steps. Firstly, the relationship between expectations and behavior is presented. Secondly, the effect of the field experiment on contribution rates is reported. Thirdly, the magnitude of the effect is compared with the correlation between expectations and willingness to contribute, leading to an analysis of heterogeneous reactions to the treatments. Fourthly, the sensitivity of the effect to framing the number of cooperators as the number of free-riders is investigated.

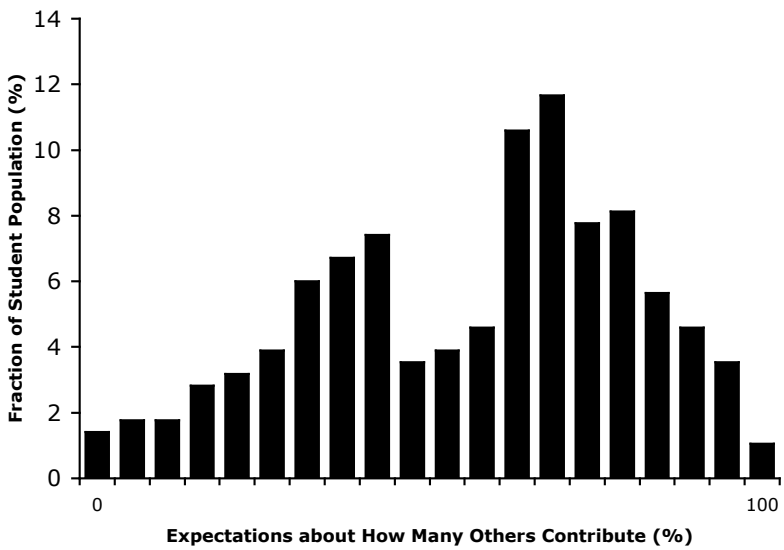
3 Analysis and Results

3.1 One's Own Behavior and Expectations About the Behavior of Others

In a first step, I analyzed whether the reported expectations about the behavior of others and one's own behavior correlate positively. On average, students expect 57 percent of their fellow students to contribute to both social funds (see figure IV.1 for the distribution of expectations), thus underestimating the real contribution rate of 67 percent of the students. This result is in line with other studies, which find that people generally underestimate the extent of pro-social behavior (for evidence on tax compliance, see Wenzel, 2001). However, the interesting question is whether expectations have an influence on one's own pro-social behavior, which is assumed to be independent of the level of expectations.

Figure IV.1

Distribution of Expectations



Data source: Field experiment at the University of Zurich, winter term 01/02.

The result of the correlation between expectations and one's own behavior shows that the higher the expectation of the students about the average group behavior, the more likely it is that these students will contribute to at least one fund. The coefficient of correlation between the expectations expressed and the contribution to at least one fund is 0.34 ($p<0.001$). Figure IV.2 plots the contribution rate and the expectations (grouped in increments of 5 percent points from $0 \leq x < 5\%$ to $95 \leq x \leq 100\%$, which leads to 20 groups). The figure shows that the positive effect is substantial. The vector of the marginal effect in a probit analysis is 0.0062 (the estimation is reproduced in panel II of table IV.3). A change in the perceived cooperation rate of others by ten percentage points, evaluated at the mean expectation, raises the probability of contributing by more than six percentage points. This result corresponds with the results of various laboratory studies. However, as discussed above, causality is not clear. A 'false consensus' effect may be at work, where people project their own behavior onto others.[47] It is therefore important to experimentally induce beliefs in order to analyze how people react when they are presented with the relatively *high* or *low* contribution rates.

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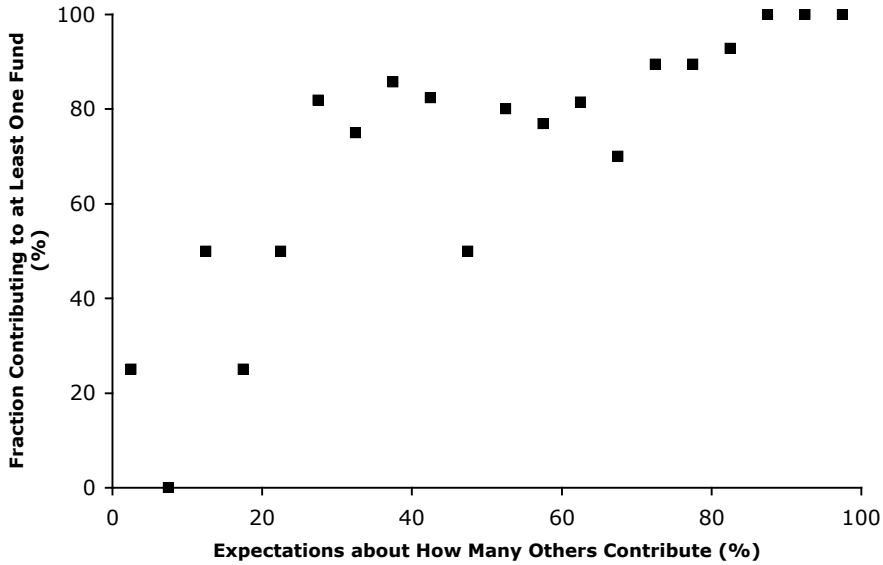
[47] Glaeser et al. (2000: 833) found evidence of such an effect in their study of trust. They conclude: "…the best way to determine whether or not a person is trustworthy is to ask him whether or not he trusts others." However, Fehr et al. (2003), in their large-scale combination of survey methods with experiments, cannot reproduce these results. In their study, "none of the survey measures of trust are good predictors of trustworthiness in the experiment" (p. 12).

Figure IV.2

Correlation between Expectations and Behavior



Data source: Field experiment, University of Zurich, winter term 01/02.

3.2 Behavioral Responses to High or Low Contribution Rate

In a second step, I analyzed whether people adapt their behavior when presented with a relatively *high* or *low* contribution rate on the part of others. The results of the field experiment are consistent with the hypothesis that people are partly driven by conditional cooperation: the probability of students contributing correlates positively with the mean contribution rate in the reference group. The percentage of students contributing to at least one of the funds increases more than 2.5 percentage points when they receive the information that 64 percent of others have contributed, compared to the group who learns that only 46 percent do so. But the difference is not statistically significant at a conventional level (t-value=1.199, $p<0.231$). However, such a result may be due to heterogeneity in people's preferences. Some students derive high utility from contributing and others presumably would suffer disutility if they had to contribute. As the decision is censored to either contributing or not contributing, those who have always given or never given should not be substantially affected by social comparison. Students whose utility gain is somewhere between the extremes should be more likely to respond. To control for such individual heterogeneity, a conditional logit model was calculated with individual fixed-effects. The average effect, therefore, is not very representative and its estimation comes with a large standard error.

Table IV.2 presents the conditional logit model, where the dependent variable takes the value 1 when the subject decides to contribute to at least one fund, and 0 otherwise. Individual fixed-effects and time dummies are incorporated. The control group consists of all students not in the treatment groups who have already decided at least two times; freshmen are thus excluded. The model can therefore test the effect of being in one of the two treatments and – more essential for this study – whether differences between the two treatments emerge.

Table IV.2

Reaction to the Behavior of Others

Dichotomous dependent variable: Contribution to at least one fund (=1);
Conditional logit model with individual fixed-effects

Variable	Coefficient (z-value)	P>|z|
Treatment *'High'* (64%)	0.401** (3.00)	0.003
Treatment *'Low'* (46%)	-0.025 (-0.19)	0.851
Individual fixed-effects	Yes	
Semester dummies	Yes	
N	70,269	
Log likelihood	-26451.239	

Notes: Test of differences for treatment *'High'* - *'Low'* = 0.0: $\chi^2(1) = 5.44$, $p < 0.0197$

Level of significance: * $0.01<p<0.05$, ** $p<0.01$.

Data source: Field experiment, University of Zurich, 2002/03.

The results of Table IV.2 support the conditional cooperation hypothesis: people who are presented with a high contribution rate are more likely to contribute than people who are told that not as many others have contributed to the funds. A χ^2-test of differences between the two coefficients for the two treatments shows that they are statistically significant at a 95%-level ($\chi^2(1) = 5.44$, $p<0.0197$). The difference in behavior due to the behavior of others is substantial, especially if one takes into account the specific features of the naturally occurring decision setting. Firstly, as the experimental intervention is based on *actual* contribution rates, no extreme cooperation rates were induced. The difference between 46% and 64% of students contributing is relatively modest compared to past laboratory studies where people are confronted with extreme cases, such as zero contribution rates (see for example, Weimann, 1994). The results therefore provide even stronger support for 'conditional cooperation'. Secondly, the students face a dichotomous decision (whether to contribute or not). This leaves little room for marginally adjusting one's behavior. To take as the dependent variable the

amount paid to the funds – which can take the value CHF 0.-, 5.-, 7.- or 12.-, depending on the students' choice to contribute to both, neither, or only one specific fund – does not change the results (see table App.IV.1 in the appendix for results on contributions to both funds). Thirdly, none of the subjects are contributing for the first time, so contributing may have become a kind of habit, where social comparison may lose some importance. Thus, the results from the field experiment show that, even in a naturally occurring situation, people react to relatively small changes in the cooperation rate of others.

Table IV.2 also shows that people react in an *asymmetrical way* to the induced *high* or *low* cooperation rates. Students *increase* their willingness to contribute when presented with many others doing so. This difference is statistically significant at the 99%-level. But they do *not decrease* their willingness when only a few others contribute. Although the difference bears the expected sign, it is not statistically significant at the conventional level. This result is surprising, because one may have expected that people would hate being in the minority of those behaving pro-socially while others free-ride. The results of the field experiment show that people mimic the behavior of free-riders far less often than can be assumed, while they behave pro-socially if they see that many others do the same. However, it may well be that people's willingness to contribute decreases if less than the experimentally induced 46 percent of the whole student population contributes.

To go into greater detail, the next section addresses the question of who is in fact most sensitive to the behavior of others.

3.3 Who Is Sensitive to the Behavior of Other Persons?

One may well expect that not all individuals behave in a cooperative way conditional on the behavior of others. Numerous studies find individual heterogeneity amongst pro-social preferences, and therefore in cooperative behavior, in social dilemma situations. Glaeser et al. (1996) explicitly incorporate different 'types' of persons into their model of social interactions. The 'fixed agents' do not react to other people's behavior in specific situations; their specific decisions are 'far too certain' to allow themselves to be affected by others. Other individuals' decisions are uncertain, however, and they are therefore more easily influenced by the average behavior in the reference group. In the case of the decision setting at the University of Zurich, it is useful to consider heterogeneous pro-social preferences. People with weak preferences about contributing to the two funds are not expected to be very sensitive to the minor change in the contribution rate of the group. People with strong preferences

about contributing are also expected not to be much affected. For people in between these extreme preferences, the behavior of others may be more decisive.

In other studies, the various types are detected by looking at how many people actually behave in a conditionally cooperative way in a laboratory experiment that test conditional cooperation. Here a different approach is used to obtain a proxy for the type of subjects.[48] In the panel data set, past behavior is used as a proxy for the pro-social preferences. People who never contributed, or those who always contributed when they had a chance to do so, are expected to react more like 'fixed agents' than people who seem to be more uncertain and have changed their behavior at least once. The coefficient of past behavior indicates the fraction of previous decision situations in which the subject decided to contribute. This is reflected by a coefficient ranging from 0 to 1. Accordingly, a coefficient of 0.5 indicates that this particular individual contributed in half of the decision situations in which he or she was involved. Chapter III provides a detailed description of the coefficient of past behavior. The subjects who are more indifferent with regard to contributing are expected to be more inclined to react to the induced beliefs.

Panel I in Table IV.3 controls for this past behavior. The dependent variable is 1 if students contributed to at least one of the funds, and is 0 otherwise. The probit model incorporates only students who were subjects of one of the two treatments. The effect of the treatment *'High'* (64%) is compared to the reference treatment in which students received the information that few others (46%) contributed (treatment *'Low'*). This procedure is chosen in order to isolate the pure effect of the information that many or few others contribute. As students of both treatment groups received an additional sheet of paper from the University, the two treatment groups differ only in the information received. As the coefficients of a probit analysis are not easy to interpret, the computed marginal effect shows how much the probability of contributing changes compared to the reference group.

The results of the conditional logit model support the claim that people contribute *ceteris paribus* more to the two funds when many others do so as well. The effect is statistically significant at the 99-percent level. The marginal effect of 4.6 percentage points is large when taking into account that the decision does not leave much room for reaction and the intervention is not strong.

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[48] Ashraf, Bohnet and Piankov (2002) use dictator game giving by individuals to explain behavior in trust games. Similar to the approach used here, they use revealed behavior to undertake a within-subject analysis.

Table IV.3

Conditional Cooperation Controlling for Past Behavior

Dichotomous dependent variable: Contribution to at least one fund (=1); probit regression

Variable	Panel I		Panel II		Panel III	
	Coeff. (z-value)	Marginal effect	Coeff. (z-value)	Marginal effect	Coeff. (z-value)	Marginal effect
Treatment 'High' (64%)	0.180** (2.20)	4.6%				
Treatment 'Low' (46%)	Reference group					
Elicited Expectations			0.0215** (5.17)	0.6%	0.0128* (2.31)	0.3%
Coefficient of past behavior	2.721** (24.30)	69.1%			2.821** (8.95)	63.8%
Constant	-1.162** (-12.59)		-0.414 (-1.79		-1.759** (-5.18)	
N	1754		250		250	
Log likelihood	-594.28409		-122.02608		-70.236785	

Level of significance: * 0.01<p<0.05, ** p<0.01.
Data source: Field experiment, University of Zurich, winter term 2002/03.

Table IV.3 also shows that past behavior is indeed an important determinant of behavior and may capture the heterogeneous preferences for contributing to the funds. A number of people have a strong preference for contributing to the two funds and their decision to contribute is relatively stable –over time as well.

The change from an induced cooperation rate of 46% to 64% can be compared to a change in the elicited expectation of the same magnitude. How much does the probability of contributing change when students either believe that 46% of other students contribute or when they believe 64% of other students contribute? Panel II shows the probit model with the reported beliefs incorporated as an independent variable. A change in expectation from 46% to 64% would reflect a change in the contribution probability of around 11.5 percentage points.[49] This effect is more than double the behavioral change that actually occurs due to conditional cooperation. The correlation between elicited expectations and behavior therefore greatly overestimates the effect of conditional cooperation. This can be explained by a 'false consensus' effect: one's own behavior influences the expectations about others to a certain extent. The 'type' of person therefore not only influences the pro-social behavior but also the expectation about the pro-social behavior of others. Panel III of Table IV.3 controls for the

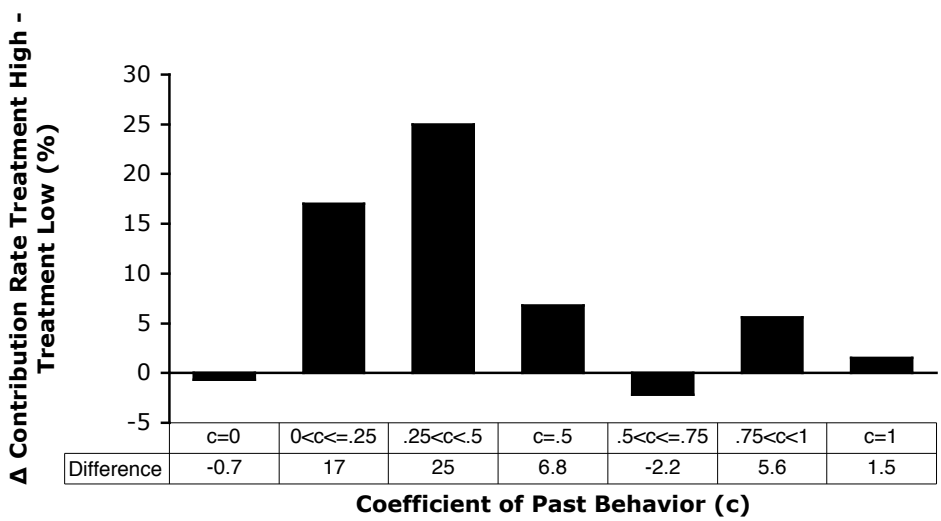
[49] I calculated the difference between the contribution probabilities at the two points of interest on the cumulative standard normal function: Φ(constant term + 64*$\beta_{expectation}$) - Φ(constant term + 46*$\beta_{expectation}$). If there are other variables in the equation, they are included at their mean value.

'type' of person by incorporating the coefficient of past behavior into the probit model. In this specification, the marginal effect of a one-percentage change in expectations is 0.003 at the mean value. A change in expectations from 46% to 64% would correspond to a change in the contribution probability of around 5.3 percentage points. This effect is more in line with the behavioral change resulting from induced beliefs, because the coefficient of past behavior captures part of the 'false consensus' effect.

In order to illustrate who reacts the most sensitively to the behavior of others, Figure IV.3 shows the behavioral differences between individuals in treatment group *'High'* versus those in *'Low',* dependent on past behavior. For example, for those who contributed in half of their previous decision situations (c=0.5), the figure reflects whether people in treatment *'High'* are more likely to contribute than those in treatment *'Low'*. The figure confirms the expectation that subjects who never (c=0) or always (c=1) contributed are not very sensitive to the behavior of others in the particular decision setting. In contrast, subjects who changed their behavior in the past pay more attention to others' behavior, according to the theory of conditional cooperation. In particular, those who have contributed less than half of the time but at least once (0<c<0.5) behave way that is especially conditional on the behavior of others.

Figure IV.3

Different Reactions to the Behavior of Others



Data source: Field experiment, University of Zurich, winter term 2002/03.

The more that people have contributed in the past, the less sensitivity they tend to have to the behavior of others. People with a strong preference for contributing to the social funds seem not to care that much about the pro-social behavior of others, even when they know that the majority are free-riding. [50] This result may be due to the censored decision setting. People who already give the full amount to the funds are not able to increase their contributions further when confronted with the information that many others contribute. The result is consistent with a model where people have heterogeneous preferences. As the decision is censored, people who have strong (or weak) pro-social preferences are not able to further increase (or decrease) their contribution. People who are more indifferent to contributing or not contributing reacted the most strongly to the information about cooperation rates in the field experiment.

The finding that the treatment effect declines the more that individuals contributed in the past is supported by a probit model. Panel I in Table IV.4 shows the relevant model with an interaction term *Treatment 'High'*Coefficient of past behavior*. The effect of the treatment declines with the coefficient of past behavior, as already shown in Figure IV.3. The joint hypothesis of Treatment *'High'* and the interaction effect not being zero is statistically significant at the 90%-level ($\chi^2 = 4.87$; $p<0.0878$). However, if the subjects who never contributed in the past are excluded, the relationship becomes much clearer as is shown in Panel II in Table IV.4. In particular, the coefficient of the interaction term *Treatment 'High'*Coefficient of past behavior* shows that the more individuals contributed in the past, the less they will react to the behavior of others. The joint hypothesis of Treatment *'High'* and the interaction effect not being zero is statistically significant at the 95%-level ($\chi^2 = 8.68$; $p<0.0130$).

[50] This result can be compared to results of a field experiment by Falk and Ichino (2003). They show that an experimentally manipulated high productivity norm increases the productivity of the least productive subject, but a low productivity norm does not have much influence on the most productive subjects.

Table IV.4

Different Reactions to the Behavior of Others

Dichotomous dependent variable: Contribution to at least one fund (=1); probit regression

	Panel I			Panel II excluding subjects who never contributed		
Variable	Coeff. (z-value)	Marg. Effect	P>|z|	Coeff. (z-value)	Marg. Effect	P>|z|
Treatment *'High'* (64%)	0.198 (1.23)	5.0%	0.219	0.533* (2.27)	10.7%	0.023
Treatment *'Low'* (46%)	Reference group					
Coefficient of past behavior	2.735** (17.27)	69.5%	0.000	3.193** (13.89)	63.6%	0.000
Interaction Treatment 'High' * Coefficient of past behavior	-0.028 (-0.13)	-0.7%	0.899	-0.424 (-1.39)	-8.4%	0.165
Constant	-1.171** (-9.95)		0.000	-1.558** (-8.55)		0.000
N	1754			1575		
Log Likelihood	-594.276			-504.530		

Level of significance: * 0.01<p<0.05, ** p<0.01.
Data source: Field experiment, University of Zurich, winter term 2002/03.

3.4 Framing Effects

Two additional treatments were undertaken in the field experiment in order to investigate whether the framing of the information about the behavior of others influences pro-social behavior. The information about average student contributions was therefore also framed *negatively*. In addition to the 2000 students who were in the two basic treatments, 1000 students received the information that a low percentage (36%) *did not* contribute (Treatment *'High neg.'*), and 1000 students received the information that a high percentage of the student population (54%) *did not* contribute (Treatment *'Low neg.'*), respectively.

The question thus posed is whether the framing of cooperators or free-riders changes pro-social behavior. One possible expectation would be that the more one shifts the focal point to the people who do not contribute, the lower the contribution rate would be. The results from the experiment, however, do not support this hypothesis. Table IV.5 presents a conditional logit model which includes individual fixed-effects and time dummies and controls for the four main treatment groups.

Table IV.5

Framing Effects and Conditional Cooperation

Dependent variable: Contribution to at least one fund (=1);
Conditional logit model with individual fixed-effects

Variable	Coefficient (z-value)	P>|z|
Treatment *'High'* (64%)	0.401** (3.00)	0.003
Treatment *'High neg.'* (36% not)	0.406** (3.23)	0.001
Treatment *'Low'* (46%)	-0.025 (-0.19)	0.851
Treatment *'Low neg.'* (54% not)	0.249 (1.91)	0.056
Individual fixed-effects	Yes	
Semester dummies	Yes	
N	71,359	
Log Likelihood	-26862.874	

Level of significance: * 0.01<p<0.05, ** p<0.01.
Data source: Field experiment, University of Zurich, 2002/03.

Two main results can be seen in table IV.5:

(1) *No statistically significant framing effects can be identified*. People's behavior does not differ whether they are either in treatment *'High'* or in treatment *'High neg.'*. A χ^2-Test for the differences of the coefficient shows that the willingness to contribute increases similarly in both treatments ($\chi^2(1) = 0.00$, $p<0.9784$). The behavioral difference between people who were confronted with either the positively or the negatively framed information that only a *few* contribute to the two funds is also not statistically significant ($\chi^2(1) = 2.30$, $p<0.1291$). However, it is remarkable that the likelihood of contribution increases if people are confronted with the information that many other are not contributing (treatment *'Low neg.'*). Because of this behavioral pattern, which suggests that people increase their contributions if many others are not contributing, the findings about conditional cooperation in the negative framing setting are ambiguous.

(2) *Results concerning conditional cooperation are ambiguous if the information is framed negatively.* According to the theory of conditional cooperation, a difference between treatments *'High'*/*'High neg.'* and between treatments *'Low'*/*'Low neg.'* should be expected. The results of the field experiment, however, show that while the behavior in treatment *'Low'* is significantly different from the behavior in both treatment *'High'* and treatment *'High neg.'*, behavior in treatment *'Low neg.'* does not statistical significantly differ from

the behavior in both treatments with high contribution rates.[51] The focus on many people not behaving pro-socially does not appear to destroy pro-social behavior; indeed, it even increases the willingness to contribute slightly.

The information is as yet insufficient for understanding why framing a situation of few contributors as a situation where many do *not* contribute has such a huge influence on behavior and why conditional cooperation seems to be sensitive to such a framing. Interestingly enough, other studies also fail to find consistent results for conditional cooperation when decisions are framed differently. Fleishman (1988) finds in his laboratory experiment that a social dilemma framed as taking from a collective good leads people to conform to others' behavior, whereas framing it as giving to a public good leads people to act even contrary to others' behavior. Although the framing in this experiment is different to the framing in the field experiment, framing effects seem to be crucially important for 'conditional cooperation' and should be included in models of choice behavior in public good situations. So far, however, no model of conditional cooperation has been put forward to capture such framing effects.

4 Concluding Remarks

This chapter has presented evidence of conditional cooperation in a large-scale field experiment, asking whether people's pro-social behavior is conditional on the pro-social behavior of others. When students were presented with the information that many others donated to two social funds at the University of Zurich, their willingness to contribute was higher than that of students who were informed that only a few others contributed. This constitutes the first tests of conditional cooperation in a field experiment about charitable giving.

The result that people's contribution varies positively with the group average has to be refined. Subjects who have never or always contributed in the past are quite insensitive to the treatments. By contrast, subjects who have changed their behavior in the past, pay more attention to others' behavior. The higher sensitivity is consistent with a model where people have heterogeneous preferences. As the decision is censored, people who have strong (or weak) pro-social preferences are not able to further increase (or decrease) their contribution.

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[51] The χ^2-tests for the differences of the coefficient show the following results: difference between treatment *'High neg.'*-treatment *'Low'*: $\chi^2(1) = 5.93$, $p<0.0148$; difference between treatment *'High'*-treatment *'Low neg.'*: $\chi^2(1) = 0.70$, $p<0.4025$; difference between Treatment *'High neg.'*-*'Low neg.'*: $\chi^2(1) = 0.80$, $p<0.3723$.

People who are more indifferent about contributing or not contributing react *ceteris paribus* most significantly to the information about cooperation rates.

The results of the field experiment on conditional cooperation are highly relevant to theories of pro-social behavior and have important policy implications. In the following I will sketch the implications of conditional cooperation for economic theory and policy:

(1) *Theory*. The behavior resulting from conditional cooperation is consistent with at least three theoretical hypothesis: firstly, people want to behave in an appropriate way and conform to a social norm (e.g. Messick, 1999); secondly, people have some sort of fairness preferences such as reciprocity (e.g. Fehr and Gächter, 2000b); or thirdly, contributions by others serve as a signal for the quality of the public good, or for the organization which provides the good (e.g. a charity) (e.g. Vesterlund, 2003). The results of the field experiment do not clarify which theoretical approach is the most appropriate for explaining conditional cooperation. Results of previous experiments that attempt to discriminate between the various explanations are ambiguous. Some experimental studies indicate that conformity can explain conditional cooperation better than reciprocal considerations (e.g. Bohnet and Zeckhauser, 2002), while others come to the opposite conclusion (Falk et al., 2003; Kurzban et al., 2001). Yet other lab experiments find evidence for the third hypothesis that the cooperative behavior of others is used as a signal for the quality of the public good (Potters et al., 2004). To proceed, future research should concentrate on testing in the field the conditions under which particular motives lead to conditional cooperation. The motives for behavior conditioned by the acts of others probably depend as much on the decision situation as do the motivations to behave pro-socially in the first place. In situations where altruism is the most prominent motive for behaving pro-socially, as in charitable giving, the signaling and conformity explanations may be more important, whereas in smaller-group contributions to public goods, e.g. not overusing a common property resource, it is reciprocal considerations that may lead to conditional behavior.

(2) *Policy implications*. Almost all models of social comparison and pro-social behavior have multiple equilibria: a ‘good’ equilibrium where all people contribute and a ‘bad’ equilibrium where nobody contributes to the public good. To derive policy implications, the question has to be answered about how best to coordinate the ‘good’ equilibrium. A number of authors propose that, because expectations about the behavior of others are crucial if multiple equilibria exist, *belief management* should bring about a cascade

towards almost full contribution and pro-social behavior (see for example Kahan, 2002). Beliefs about the behavior of others can thus be manipulated if the visibility of anti-social behavior, such as littering or criminal activities, can be suppressed by selectively informing the public or by removing the signs of the anti-social behavior (e.g. litter), as fast as possible.[52] A second possibility for exploiting the tendency towards conditional cooperation would be to introduce the composition of neighborhoods as a factor. Moving low-income families into richer neighborhoods would, for example, decrease the likelihood of children from the low-income families committing crime (Ludwig et al., 2001; Moffitt, 2001). A third possibility for achieving the 'good' equilibrium would be to rely on the law as a coordination device. People could then take the behavioral rules set by law as a signal for appropriate behavior. The results of the experiments by Bohnet and Cooter (2003) show that more research has to be undertaken to establish whether the law really can lead to a 'good' equilibrium in other than coordination games, i.e. in public good situations. According to their results, this has to be doubted.

The proposals neglect, however, to consider the incentives of politicians. Politicians have, for example, very low incentives to put poor families into rich neighborhoods because wealthy voters might oppose policies which appear to decrease the 'quality' of the neighborhood and hence result in lower values of their houses. In addition, belief management might be used by politicians very selectively because beliefs about pro-social behavior also influence the probability of re-election. The important consideration that the performance of politicians may be biased is at odds with the idea of political competition. To assess the expected effect of various policy implications, it is therefore crucially important to take the incentives of politicians into account.

Both economic theory and policy has to take into account the result that people's behavior is conditional on the behavior of the group average. If such behavioral regularity is incorporated, behavioral predictions will become more accurate and policy-makers can take full advantage of the fact that a small change in policy can have tremendous effects on the equilibrium.

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[52] In the private sector, fundraisers exploit people's tendency to mimic others' behavior by announcing what the others have given. They list leaders' donations or establish 'seed money' before asking further potential donors (see Andreoni and Petrie, 2004).

Chapter V

Matching Donations: Subsidizing Pro-Social Behavior

Donations to charitable organizations and contributions to public goods are important activities for society. Many charitable organizations depend fully on private contributions. The question how giving behavior can be actively fostered is therefore important for these organizations and for the private provision of public goods in general. From the point of view of economic theory, decreasing the price of a donated monetary unit should stimulate donations. Such subsidizing can be done either by a rebate or a matching mechanism that supports charitable giving. Concerning the rebate mechanism, there is substantial literature on how tax deductions for charitable contributions influence their size. For an overview of the results, see chapter II.

A second approach to subsidizing charitable contributions is to match donations. A matching donations mechanism decreases the cost of giving because the donors' contribution is worth more. This mechanism is popular in a number of corporations in the U.S. and in Europe, where employers match charitable contributions on the part of their employees. There is, however, little research that analyzes the effect of matching donations on charitable contributions. One reason for this may be the statistical problem involved. If one were to observe that employees of a firm with a matching mechanism donate more than the employees of a firm without such a mechanism, this would not support the hypothesis that matching leads to a behavioral effect. The higher contribution rate in the first firm may be due to various reasons not connected with the matching mechanism; for instance, it may be that, due to the fact that the first firm has a matching mechanism, more pro-social employees select to work for that firm. To test the effect of matching donations, people have to be randomly assigned to a matching mechanism. This can be analyzed in an experimental setting. Eckel and Grossman (2003) present the only study I am aware of which systematically analyzes matching donations in a laboratory experiment. They analyze whether the rebate scheme and the matching mechanism lead to the same behavioral effects. From a theoretical point of view the two

mechanisms should yield the same results. It should not matter whether you pay 50 cents for a $1 donation due to the fact that you get 50 cents back or someone increases your donation by 50 cents. The results of the experiments show, however, that it is important whether the rebate mechanism or the matching mechanism is used. Matching donations leads to a higher amount of charitable giving than a rebate and is therefore more effective.

This chapter tests the effect of matching donations in a *controlled field experiment*. The donations of two groups of 300 students each are matched by 25 percent and by 50 percent respectively if they contribute to *both* Funds. The resulting behavior is compared with the control group, whose donations are not matched. The results of the field experiment support the hypothesis that matching donations increases the contributions to a public good. However, the effect depends first of all on the amount paid on top. While the lower amount has no statistically significant effect on the willingness to contribute, the higher amount does affect the likelihood of contributing. Secondly, the effect of matching donations depends on the 'type' of person whose potential donations are subsidized. People need to be already pro-socially inclined to react to the relative price effect of the matching mechanism.

The effect of the donation-matching mechanism is not trivial due to two possible counter-productive effects. Firstly, a classical crowding-out effect can decrease the overall amount donated so that people reduce their contribution to the point that the total amount of giving (the matched contributions included) equals the amount donated without matching. Secondly, a motivational crowding-out effect can take place (Deci and Ryan, 1980; 1985; Frey, 1997). People may perceive the donation matching as controlling, which may destroy their intrinsic motivation to donate. When the matching amount is very small, a motivational crowding-out effect may be stronger than the ordinary price effect and donations may decline. The result of the field experiment can neither confirm nor deny the two counterproductive effects. However, some patterns of behavioral reaction to the donation-matching mechanism suggest that there is more at work than just the normal relative price effect.

1 Design of Field Experiment

In the experimental intervention, two groups of 300 students each were selected randomly and provided with information about the matching mechanism. With the official letter for re-newing the registration and the decision about contributing to the two funds (for the winter semester 2002/2003), the University administration supplied the selected students with a sheet

of paper containing the following information: "If you contribute to *both* social funds, an anonymous donor will match your contribution by CHF 3" (treatment *'Matching 25%'*), or "CHF 6" (treatment *'Matching 50%'*). The potential donations are therefore matched by 25% and 50%, respectively. The sheet of paper that the two treatment groups received differed only with respect to the amount matched. The subjects were informed that the matched money would be split equally between the two funds. The two funds received the additional money after the experiment.

Due to the 'institutional difference' that freshmen have to pick up the registration form at the counter of the administration office, only students who had registered and decided at least once in the past are in the treatment groups. The freshmen are also excluded from the control group. Students who were part of any other treatment, i.e. the field experiment discussed in chapter IV, were also excluded from the control group. As most treatments were designed to increase the donations (which was a precondition for the University administration's participation), subjects of other treatments would have biased the behavior of the control group. As some of the students decided not to renew their registration, the decisions of 532 subjects in the two treatment groups could be observed. Students decide anonymously at home about the contribution to the two social funds.

Table V.1 shows the summary statistics for the control group and the treatment group. As the assignment was random, no significant differences emerged between the characteristics of subjects in the treatment group and the rest of the student population.

Table V.1

Summary Statistics for Donations, Winter Term 2002/03

Personal characteristics	Control group	Treatment 'Matching 25%'	Treatment 'Matching 50%'
Observations	12,518	265	267
Number of semesters	11.5 (8.3)	11.3 (8.3)	11.3 (7.4)
Age	28.3 (7.3)	28.5 (7.7)	28.0 (7.8)
Gender (=Female)	51%	53%	50%
Economists	11%	9%	12%
Coefficient of past behavior	0.73 (0.36)	0.71 (0.38)	0.73 (0.35)

Notes: Standard deviations in parentheses.
Data source: Field experiment and data provided by the accounting department of the University of Zurich.

The data set has some special characteristics which may be important, especially when comparing the results of our analysis to results from laboratory experiments. Firstly, the field experiment is based on a trichotomous decision. Students can decide whether to contribute to no fund, one fund or both funds. Most students decide either not to contribute at all or to contribute to both funds. No marginal adjustment is possible in the sense that people increase their contribution by one or more monetary units. This means that students are censored in their decision because they cannot increase or decrease their contributions if they already give the full amount or nothing. The expected effect of a change in relative prices should therefore be small. Secondly, people in the treatment group have decided whether to contribute or not at least once before the field experiment started. On average, subjects had decided 10 times previous to the start of the experiment. If contributing has become a habit, the donation matching must be expected to have limited effects on behavior.

The next section presents the hypotheses for the field experiment.

2 Behavioral Hypotheses

Charitable giving is subject to the relative price effect, just like any other activity: if donations are getting cheaper, people will undertake this activity more. For the field experiment, this leads to three hypotheses:

> *HYPOTHESIS 1*: More people will donate to both funds in the treatment groups than in the control group, because matching makes giving cheaper than in the treatment groups.
>
> *HYPOTHESIS 2*: The higher the matching benefit of each Swiss franc donated, the more people will donate. In the field experiment, more people are expected to donate in treatment ‘Matching 50%’ than in the treatment ‘Matching 25%’.
>
> *HYPOTHESIS 3*: People who otherwise donate to only one of the funds will be strongly motivated to contribute to both funds due to the fact that they can ‘profit’ from the whole matching amount by a slight increase in their contribution.

The derived hypotheses are based on assumptions about (1) the character of the charitable giving and (2) the effect of a change in relative prices. However, these assumptions are crucial, because there are counterproductive effects which can put the hypothesis in question.

(1) Charitable donations are assumed to have a Joy-of-Giving (or 'warm glow') effect (e.g. Cornes and Sandler, 1994; Andreoni, 1990). This suggests that it is important that people personally donate to the two funds. The larger the effect they can personally achieve by donating, the more they will enjoy giving. This assumption contrasts with the neutrality results of public goods models, where people reduce their donations when they see that the government or other individuals increase their share of the public good (see e.g. Roberts, 1984; Andreoni, 1988). Pure altruism models predict that the donation-matching mechanism would influence people to decrease their share, because, due to the matched amount, they can produce the same donation amount as if no such mechanism existed. Which model is appropriate is an empirical issue. Pure altruism models are not supported in the empirical literature: people's donations are not completely crowded-out by government contributions (e.g. Ribar and Wilhelm, 2002), nor do people reduce their contribution when the contributions of others increase, as was seen in chapter IV.

(2) A motivational crowding-out effect can work against the relative price effect (Frey, 1997). People who donate in an anonymous situation to a public good have an intrinsic motivation to do so. Due to the underlying incentive structure, contributions are not utility-maximizing in strictly monetary terms. Offering these individuals a matching mechanism can be perceived as controlling. According to Deci (1975) and Deci and Ryan (1985), this may lead to a decrease in pro-social behavior, due to a perceived reduction in self-determination. A quite different explanation for a detrimental effect of monetary incentives may be based on the prestige motive of charitable giving. A monetary incentive to behave pro-socially may decrease the value of the generosity being signaled. If people are motivated to contribute to a charity in order to signal to themselves ('warm glow') or to others that they are generous, monetary incentives can decrease this signal because it will become more and more unclear whether people are behaving pro-socially out of generosity or because of the monetary incentives. According to this reasoning, a possible empirical test would analyze whether charitable donations make people less happy when the tax incentives for donations are increased.

A strong motivational crowding-out effect may lead to an overall effect that works contrary to the relative price effect (see chapter II for an overview). There can be two diverging overall effects of matching contributions. Firstly, the crowding-out effect may dominate the relative price effect of matching. This is likely to be the case when the relative price effect is small, as in the small matching treatment ('*Matching 25%*').

Secondly, the relative price effect may dominate the crowding-out effect. This is likely to be the case when the incentives based on matching are large ('*Matching 50%*'). Gneezy (2003) and Gneezy and Rusticini (2000) find experimental support for the proposition that the relative price effect dominates when the monetary reward is sufficiently large.

In addition to the two counterproductive effects, people may be heterogeneous in their pro-social preferences, which might be important with respect to the effect of matching donations. As stated in a survey on previous experimental studies, "the most important heterogeneity is the one between purely selfish subjects and fair-minded subjects" (Fehr and Schmidt, 2003: 247). Pure egoists, who are not pro-socially inclined towards the funds at all, are expected not to react to the relative price effect induced by the donation-matching mechanism.

In the following section, these hypotheses are tested.

3 Analysis and Results

3.1 Effect of Matching Donations

Table V.2 presents the descriptive statistics for the field experiments. The table shows the contribution rates to both funds, only one fund or no fund for the control group and the two treatment groups in the semester when the field experiment was undertaken. The last three columns present t-tests for the differences in contribution rates between the control and the treatment groups, and between the two treatment groups.

Table V.2 shows three results in line with the hypotheses:

(1) People react to the matching donations mechanism. In both treatment groups, contribution rates to both funds are higher than in the control group. These figures are consistent with hypothesis 1, suggesting that people react to the relative price effect. However, the differences between contributions to both funds in the treatment group compared to the control group are not statistically significant. This may be due to the fact that the relative price effect is not concise enough, or that either a classical or a motivational crowding effect has kicked in.

Table V.2

Patterns of Giving to the Two Funds Across Treatments

Percentage who contribute ...	Control group	Treatment 'Matching 25%'	Treatment 'Matching 50%'	Difference 'Matching 25%'-Control	Difference 'Matching 50%'-Control	Difference 'Matching 50'-'Matching 25'
... to both funds	65.29% (0.43)	65.66% (2.9)	70.04% (2.8)	0.37% (t=0.125; p<0.900)	4.75% (t=1.614; p<0.107)	4.38% (t=1.080: p<0.281)
... to only one fund	6.80% (0.22)	4.91% (1.3)	3.37% (1.1)	-1.89% (t=1.214; p<0.225)	-3.43% (t=2.213; p<0.027)	-1.53% (t=0.089; p<0.375)
... to neither of the funds	27.91% (0.40)	29.43% (2.80)	26.59% (2.70)	1.52% (t=0.546; p<0.585)	-1.32% (t=0.476; p<0.634)	-2.84% (t=0.729; p<0.466)
N	12518	265	267			

Notes: Standard errors in parentheses.
Data source: Field experiment, University of Zurich, winter term 2002/03.

(2) The increasing effect of matching donations is clearly visible for the treatment ‘Matching 50%’. As revealed in table V.2, the contribution rate to both funds is 4.75 percentage points higher than in the control group ($t=1.614$; $p<0.107$). For treatment ‘Matching 25%’, the contribution rate is only slightly higher than in the control group. Due to the relative price effect, the subjects in treatment ‘Matching 50%’ should react most strongly. In addition, the price effect seems more likely to be dominating the countervailing crowding-out effect in treatment ‘Matching 50%’ than in treatment ‘Matching 25%’. The very small effect of ‘Matching 25%’ may be due to the fact that the normal price effect is not large enough or that the countervailing crowding-out effect is of similar magnitude and therefore has no significant effect on donations. In any case, the results suggest that the effect of matching donations in the field experiment is due to the higher change in relative prices in treatment ‘Matching 50%’. The pattern corresponds with hypothesis 2.

(3) The patterns of giving to only one fund or no fund are consistent with hypothesis 3. Fewer individuals contribute to only one fund because, with just a slightly higher contribution, subjects can ‘gain’ the whole matching amount. This applies especially for the higher incentive to contribute. The contribution rate to only one fund is 3.43 percentage points lower for treatment ‘Matching 50%’ compared to the control group. This effect is statistically significant at the 95%-level. The contribution rate to only one fund is also lower for treatment ‘Matching 25%’, but the difference is not statistically significant. Interestingly enough, a larger number of subjects do not contribute at all in treatment ‘Matching 25%’, compared to the control group. The pattern for ‘Matching 25%’ thus is consistent with a motivational crowding-out effect. People *reduce* their contributions as a result of the incentive given, which is in contrast to the standard economic prediction. The result, however, is not statistically significant. For the treatment ‘Matching 50%’, the contribution rates are as expected; the share of people who do not contribute at all decreases. The pattern of giving, however, shows that the positive effect of matching donations comes from the high matching mechanism and mostly from subjects who change from single-fund giving to giving to both funds. The matching mechanism seems therefore unable to decrease the share of people who do not contribute at all.

In the above analysis, individual heterogeneity generates a lot of interference, which makes it difficult to estimate the effect of matching donations. A logit model was therefore estimated taking into account individual fixed-effects and semester dummies. Although the subjects are

randomly assigned to the different treatment groups, the fixed-effects model allows reducing the noise in the estimations.

Table V.3 presents the results for the logit model with individual fixed-effects. The dependent variable takes the value 1 if people contribute to both funds and 0 otherwise. The general picture of table V.2 is confirmed. The probability that subjects faced with the mechanism 'Matching 50%' will contribute to both funds increases in a statistically significant way (at the 90%-level). The effect of 'Matching 25%' on the contribution rate of subjects in this treatment group is half as large. The behavioral difference, compared to the control group, is not statistically significant. The results are consistent with hypothesis 1 and hypothesis 2 in so far as the amount of matching is decisive for the success of the donation-matching mechanisms. The results suggest that a small change in relative prices does not produce any significant effect on behavior.

Table V.3

Effect of Matching Donations

Dichotomous dependent variable: Contribution to both Funds (=1)
Conditional logit model with individual fixed-effects

Variable	Coefficient (z-value)	P>|z|
Treatment 'Matching 25%'	0.278 (1.29)	0.195
Treatment 'Matching 50%'	0.469* (2.15)	0.032
Individual fixed-effects	Yes	
Semester dummies	Yes	
N	75,741	
Log likelihood	-28617.166	

Notes: Test of differences for treatment *'Matching 25%'* - *'Matching 50%* = 0.0: $\chi^2(1) = 0.39$, $p < 0.5309$
Level of significance: * $0.01<p<0.05$, ** $p<0.01$.
Data source: Field experiment, University of Zurich, 2002/03.

Although the results are not as strong as in Eckel and Grossman (2003), they do show that a matching mechanism has a positive effect on pro-social behavior in a field setting. Depending on the underlying motives for contributing to the two funds, the positive effect of the matching mechanism can be due to various reasons. Firstly, the matching mechanism can trigger a relative price effect, where an individuals' contribution has a larger effect with the same monetary outlay. Secondly, the fact that an anonymous donor is matching the contributions of the students may be interpreted as a positive signal for the quality of the social funds. People

may, therefore, be more inclined to contribute. Thirdly, the fact that somebody else is socially concerned and matches the contributions of the students may be seen as a nice act, which a conditional cooperator may want to reciprocate. As the analysis in its present form is not able to discriminate between these explanations, further studies should try to distinguish between these channels of a matching mechanism. The results should then be compared to the effects on charitable giving of mechanisms similar to matching donations, for example 'seed money' (List and Lucking-Reiley, 2002; List and Rondeau, 2003) and 'leadership giving' (e.g. Andreoni, 1998).

In order to come to a better understanding of how the matching mechanism influences giving behavior, the next section analyzes who in fact is most sensitive to the change in the price of giving induced by the donation-matching mechanism.

3.2 Who Reacts to Matching Donations?

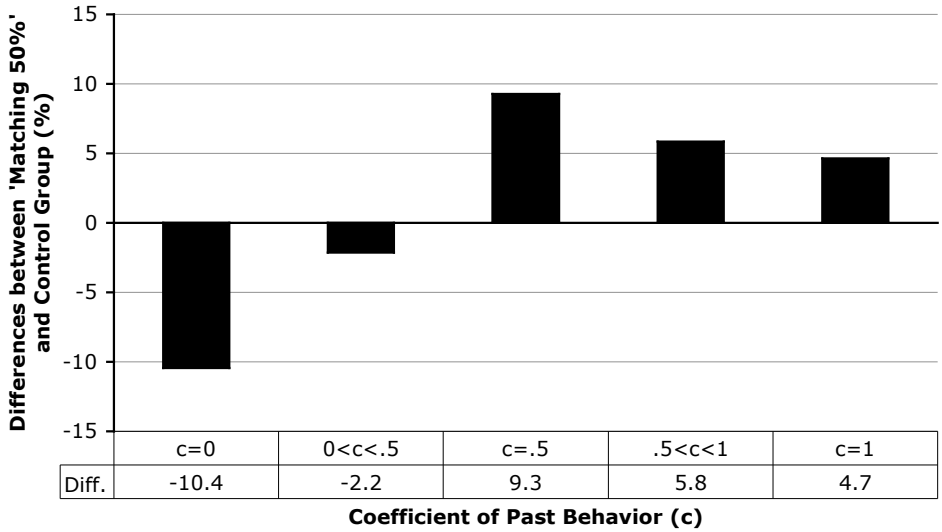
People are heterogeneous with respect to their pro-social preferences. Some may be selfishly inclined, while others place more emphasis on other people's well-being (or have pro-social preferences for other reasons). In this section, the giving patterns of various 'types' of people and their reaction to a change in the price of giving is analyzed.

In the panel data set, past behavior is used as a proxy for the subjects' pro-social inclination. The coefficient of past behavior indicates the fraction of previous occasions on which the subject decided to contribute to at least one of the two funds (see chapter IV for a detailed description). People who never contributed to even one fund are expected not to react to matching donations. People who always contributed in the past are also not expected to react much to the change in relative prices because their decision is censored. Even if they wanted to increase their contribution due to the higher effectiveness of their donation, they are not able to give more money to the two funds. The effect of matching donations is therefore underestimated.

Figure V.1 shows the effect of the treatment 'Matching 50%' on the different types compared to the control group. The figure shows, for example, whether people who contributed in half of their decisions to at least one fund (c=0.5) are more likely than the control group to contribute when they are in the treatment 'Matching 50%' (for the contribution rates of both treatments, see figure App.V.1 in the appendix).

Figure V.1

Different Reaction to Matching Donations



Data source: Field experiment, University of Zurich, 2002/03.

The figure is consistent with the hypothesis that selfish people do not react positively to matched donations. Matching is a policy instrument which does not seem to be able to activate pro-social behavior in selfishly inclined persons. This result is in line with empirical studies that analyze the effect of taxes on charitable giving. Clotfelter (1980) presents evidence that new itemizers may be less sensitive to price changes than former itemizers. Even if the price of giving decreases, donating is still an altruistic act and selfish types will not be convinced to start donating. Figure V.1 shows that, for people who have never contributed in the past, the donation-matching mechanism even has a strong negative effect.[53] The mechanism may strengthen their conviction not to contribute. In terms of evaluating the roots of the detrimental effect of monetary incentives, this result is informative because it is not consistent with the suggestion that intrinsic motivation to behave pro-socially can be crowded-out. People who have never contributed in the past can be assumed to have little intrinsic motivation. Nevertheless, the incentives given by the matching mechanism seem to allow selfish students to further legitimize their selfish behavior. The various mechanisms leading to the negative effects of monetary incentives are far from being completely understood.

[53] A negative effect may be possible, because some people who have never contributed in the past may start contributing. However, the probability that this will happen decreases for people in the treatment group.

In contrast, the effect of matching donations has the greatest positive effect on pro-socially inclined people. People who have contributed half of the time to at least one fund react the most. For people who almost always contributed in the past, this means that they do not stop contributing.[54] The donation-matching mechanism therefore helps to stabilize the contributions of the most pro-socially inclined subjects. One has to be aware that the students are censored in their decisions. For example, people who always donated to the two funds may be prepared to increase their donations even more in the matching scheme. It is therefore possible that the stronger the preference to contribute to the two funds as indicated by the coefficient of past behavior, the more sensitive people are to the price of giving.

Table V.4 presents a probit model for the semester in which the field experiment was undertaken. The dependent variable is 1 when people contributed to both funds in the semester under analysis. As the coefficients in the probit model are difficult to interpret, marginal effects are computed, indicating how much the probability of contribution changes compared to the reference group. Panel I covers all subjects in order to test the effect of being in the two treatments. Control variables are gender (female=1), being an economist (=1), age and number of semesters. The results show that the treatment 'Matching 50%' increases the probability of contribution to the two funds by 4.9 percentage points. This effect is statistically significant at the 90%-level. The treatment 'Matching 25%' has no effect on the probability of contributing to both funds. However, these results look different when one *excludes* subjects who have never contributed in the past. Panel II shows the result for this subsample. The marginal effect of treatment 'Matching 50%' increases to 6 percentage points ($p<0.05$), while the marginal effect of treatment 'Matching 25%' increases to 4.2 percentage points, but is not statistically significant. For those people who are pro-socially inclined, both treatments with either lower or larger matching seems to have a positive effect on contributions.

[54] The willingness to contribute to the funds otherwise decreases with repetition, see chapter III.

Table V.4

Pro-socially Inclined People React to Matching Donations

Dichotomous dependent variable: Contribution to both funds (=1), probit regression

Variable	Panel I		Panel II (sample without ‚selfish types')	
	Coeff. (z-value)	Marginal effect	Coeff. (z-value)	Marginal effect
Treatment *'Matching 25%'*	-0.000 (-0.00)	0.0%	0.128 (1.38)	4.2%
Treatment *'Matching 50%'*	0.136* (1.66)	4.9%	0.187** (2.07)	6.0%
Gender (Female=1)	-0.081*** (-3.51)	-3.0%	-0.098*** (-3.92)	-3.3%
Economists (=1)	-0.184*** (-4.99)	-7.0%	-0.204*** (-5.12)	-7.2%
Age	0.018*** (8.03)	0.7%	0.017*** (6.99)	0.6%
Number of Semesters	-0.022*** (-11.32)	-0.8%	-0.018*** (-8.58)	-0.6
Constant	0.196*** (3.67)		0.355*** (6.18)	
N	13,050		11,718	
Log likelihood	-8337.8526		-6974.1552	

Level of significance: * 0.05<p<0.1, ** 0.01<p<0.05, *** p<0.01.
Data source: Field experiment, University of Zurich, winter term 2003/03.

The *control variables* show the following effects: the probability that women will contribute to both funds is 3 percentage points lower than for men. *Gender*, as well as all other control variables, has a coefficient which is statistically significant at a 99%-level. The gender effect contradicts other, mostly laboratory, studies, which find that women tend to be more generous in donating (e.g. Eckel and Grossman, 1997). However, there are also studies in line with our estimates (for a review, see Eckel and Grossman, 2001). In the next subsection, the gender effect is more closely investigated. *Economists* behave less pro-socially than non-economists. As will be shown in the next chapter, this is mostly due to a selection effect. *Age* has a positive effect on pro-social behavior. Older people behave more pro-socially than younger people. This result is in line with many studies about giving behavior (for a survey, see Clotfelter, 1997). With *repetition of the decision*, people's willingness to contribute to both funds decreases (Ledyard, 1995).

3.3 Gender Differences and the Price of Pro-Social Behavior

The results of the empirical analysis suggest that women tend to behave less pro-socially than men. This result has to be seen in the context of a long list of studies investigating which sex behaves more fairly. As the results of these studies are diverse, Andreoni and Vesterlund (2001) investigate whether the price of giving may explain differences in the pro-social behavior between men and women. They show that the demand functions for the pro-social behavior of men and women intersect. Men behave more pro-socially when prices are low; however, when the cost of undertaking a pro-social act increases, women tend to behave more altruistically than men. This result cannot be found in all experimental studies. Eckel and Grossman (1996b: 144) conclude in their study that "men's behavior appears to be unaffected by [the] relative price (…)".[55]

The field experiment presented in this chapter allows testing in a natural setting whether men and women react differently to price changes for pro-social behavior. The results do not support the results by Andreoni and Vesterlund. Figure V.2 shows the contribution rates for men and women to both funds, depending on the different prices of giving in the treatment groups. Women are less willing to contribute to the two funds in the control group (64.4% contribution rate vs. 66.2%; t-test of differences: $t=2.15$; $p<0.0315$). As the price of giving decreases, women become more willing to contribute to the two funds, while for men the willingness does not increase to the same amount and even decreases for treatment 'Matching 25%'. The demand functions of men and women tend to intersect. The difference, however, is not statistically significant, as revealed by a difference-in-difference analysis (for the results, see table App.V.1 in the appendix). The results suggest that the results by Andreoni and Vesterlund (2001) do not necessarily generalize to field experiments. Further investigation is needed to ascertain whether gender differences emerge in respect to changes in relative prices for pro-social behavior.

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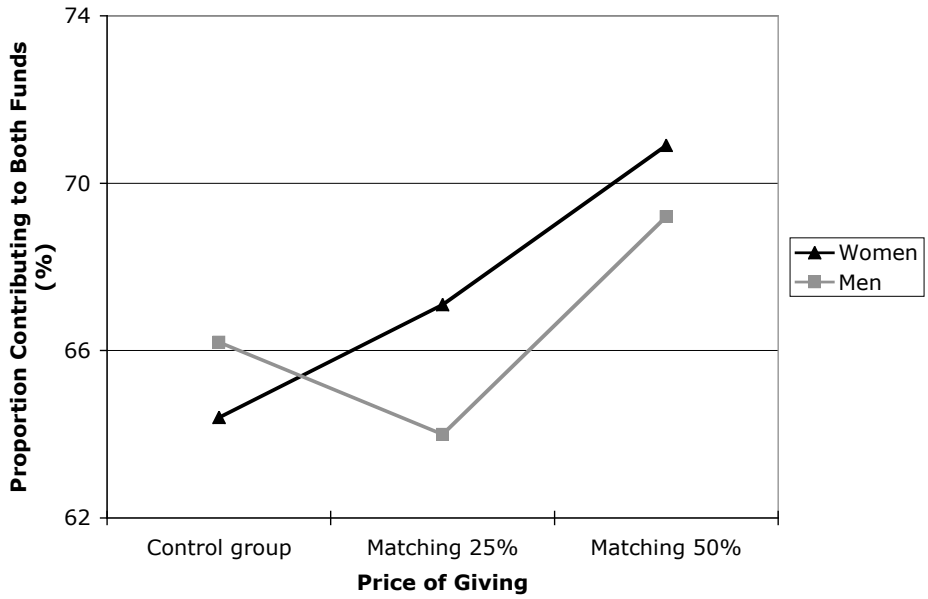
[55] For a field study on the generosity of men and women, see Andreoni et al. (2003). In their analysis of the charitable giving of married couples and of single men and women they find significant differences between the generosity of men and women depending on the price of giving. Their analysis, however, is more focused on the bargaining process about charitable giving in the household than on the differences in pro-social behavior of men and women, which may explain the different results of laboratory experiments.

Figure V.2

Gender Differences and Price of Giving



Data source: Field experiment, University of Zurich, winter term 2002/03.

4 Concluding Remarks

This chapter has tested the effect of a matching mechanism on donations in a controlled field experiment. The donations of students at the University of Zurich were matched. The results support the hypothesis that a matching mechanism increases contributions to a public good in a field setting. However, the effect depends on how much the contributions are matched. Whereas a 25 percent increase of a donation does not increase the willingness to contribute, a 50 percent increase does have an effect.

In addition, people need to be socially inclined to react to the matching mechanism. As people have heterogeneous pro-social preferences, they react differently to a change in the price of giving. On the one hand, as in a standard model, people who strongly prefer not to contribute to the two funds are not expected to react to a change in relative prices. By changing the relative prices of giving, selfish types cannot be motivated to behave pro-socially. On the other hand, people who have a strong preference for pro-social behavior will react the most. As the decision to contribute to the two funds is censored, people who always gave the maximum amount to the two funds cannot increase their contribution more. On the one hand, it makes perfect sense that people who did not contribute in all their previous decisions would

have the biggest increase in contributions. On the other hand, the general effect of a matching mechanism may be underestimated due to the fact that pro-socially inclined people would increase their donations if they had the opportunity.

The question remains whether the results of the field experiment can provide information about a potential motivational crowding effect of the matching mechanism. Some results are consistent with a crowding effect of monetary incentives. For example, if the donations are matched by a relatively small amount, the share of students who does not contribute to any fund increases. However, the effects are not large and not statistically significant. Interestingly enough, matching the contributions of people who never contributed in the past slightly decreases their willingness to contribute. Neither result, however, is conclusive enough to answer whether one should expect a detrimental effect from matching donations or what mechanisms would lead to such a crowding out of pro-social behavior. It is therefore important to study further the effect of monetary incentives on pro-social behavior.

Chapter VI

Economic Education and Pro-Social Behavior: Selection or Indoctrination?

Pro-social behavior may depend not only on social comparisons and relative costs, as discussed in previous chapters, but may also be shaped by education. Education might, for example, influence beliefs about the behavior of others in a way that has effects for pro-social behavior. Particularly in situations where multiple equilibria exist, even small changes in beliefs may be crucial for the maintenance of pro-social behavior. If a certain kind of education therefore systematically lowers the provision of public goods, then such a negative relationship has to be analyzed with a view to possibly correcting it.

Economics training is one kind of education which is constantly accused of preventing the provision of public goods by lowering students' pro-social behavior. Economic science has, according to this claim, a blind spot. It is said that, while students are taught efficiency, equity is not given its due weight in the education of economists. Moreover, it is argued that the *homo oeconomicus* is too narrowly defined, and that it does not explain the behavior of human beings accurately. A consequence of this oversimplified description of human behavior is that students of economics act more selfishly than students of other social sciences (e.g. Kelman, 1987). Ostrom (1998: 18) explicitly warns: "We are producing generations of cynical citizens with little trust in one another, much less in their government. Given the central role of trust in solving social dilemmas, we may be creating the very conditions that undermine our own democratic ways of life." The "ruthless" behavior of firms may be partly explained by the economic educations of their CEO's. Daboub et al. (1995: 165), for example, believe that "[…] corporate illegal activity will be stronger for firms whose TMT's [Top Management Team] have a greater amount of formal management education (i.e., a greater percentage of MBAs)." According to these views, economists *create* the type of selfish persons (the homo oeconomicus) they axiomatically assume in their theories. If this claim holds in reality, then critics are right to emphasize that economic science makes much-needed cooperation in the world more difficult.

In this chapter, the claim about the negative influence of economics education on pro-social behavior will be investigated empirically using the contributions to the two social funds at the University of Zurich. Section 1 emphasizes the difference between the analysis undertaken and the empirical approach from previous studies. Section 2 presents the two behavioral hypotheses: selection and indoctrination. In section 3 the empirical analysis and the results are discussed. Section 4 offers concluding remarks.

1 Previous Research

There are three ways of addressing the question of whether economics education makes students less pro-social: (1) asking questions about students' attitudes, (2) analyzing their behavior in laboratory experiments, and (3) looking at real-life behavior.

(1) *Survey studies*. As early as 1966, Sawyer (1966) found substantial differences between the attitudes of business students and other students. He concludes that "…business students are more concerned strictly with maximizing their own welfare, disregarding the other's …" (p. 414). Others, like e.g. Schein (1967), test the extent to which attitudes change with management education. His results do not show that students change their 'General Cynicism' between the beginning and the end of their degrees. Later studies, which are more interested in the impact of ethics courses, found that "the decisions made by business students were significantly less ethical […]" than law students (McCabe et al., 1991: 955). A follow-up study shows that business students hardly change their ethical attitudes, whether they take an ethics course or not (McCabe et al., 1994). Similar results for economics students are found by Gandal and Roccas (2000), who analyze the values embraced by economists and non-economists. They identify differences in the value priorities reported by students of economics compared to non-economists, but these differences already emerge before any economics indoctrination can take place. The difficulty with such studies may of course be that telling the truth is of no benefit. Either economists or non-economists may express what they perceive to be appropriate behavior, while in reality they would have behaved in a totally different way.

(2) *Laboratory experiments*. Taking into account some of the shortcomings of surveys, most studies in economics use laboratory experiments to analyze behavioral differences. Students, for example, play a prisoner's dilemma game and earn the varying amounts of money. In such settings, material incentives exist to behave 'selfishly'. In this academic

community, the results of Frank et al. (1993a; 1996) showing that economics education has a negative influence on students' cooperative behavior (i.e. that there is an indoctrination effect of economics) is widely accepted. But the literature on the topic is less uniform than suggested by Frank et al. (1996: 192), who argue that there is "... a heavy burden of proof on those who insist that economics training does not inhibit cooperation." While Carter and Iron (1991: 174) find that "economists are born, not made", there are many more experimental studies which do not find a negative effect of economics education on cooperative behavior (Marwell and Ames, 1981; Frey et al., 1993; Bohnet and Frey, 1995; Seguino et al., 1996; Cadsby and Maynes, 1998; Stanley and Tran, 1998; Frank and Schulze, 2000). Laboratory experiments, however, have their shortcomings. These studies cannot exclude the factor that economists see the experimental setting as "an IQ test of sorts" (Frank, 1988: 226). Students may play according to the equilibrium learned in their economics classes, but they do not apply it to real-life situations. Therefore, if economists set up economic experiments with other economists to see whether they behave like economists, they should not be surprised if they really do so.

(3) *Field evidence*. Only two of the previous studies on this topic go beyond laboratory experiments. One of them is a "lost letter" experiment by Yezer et al. (1996), where envelopes containing money are dropped in different classrooms. On the basis of the number of letters returned, the study concludes that economists are even more honest than students of other subjects. However, the authors cannot control for personal characteristics (e.g. gender and age) as they do not know who picks up the envelope. A second paper, looking at 'real world' behavior, is that of Laband and Beil (1999). They investigate the differences in the professional associations' dues payment, which are income-based but where income is self-reported (hence, the correct amount cannot be enforced). With that in mind, the authors undertake a survey of the members' "true" income and find that sociologists are more likely to cheat than either economists or political scientists. If the 'monetary' incentives for cheating (owing to different dues) are taken into account, the authors believe that there are no significant differences between professional academics. But there again, this study does not control for personal characteristics. Business students may differ from other students in their composition according to factors such as gender. Were women to behave more pro-socially, we would not observe an effect of business education but of gender composition. In addition, the setting in the two studies mentioned does not allow discriminating between selection and indoctrination effects when it comes to behavioral differences between economists and non-economists.

To sum up, the evidence about the effect of economics education on students' behavior is mixed. Most studies are restricted to survey evidence or laboratory experiments, both of which have their shortcomings. In this chapter, the question of whether economists behave less pro-socially can be addressed in a natural setting. As both selection and indoctrination may be at work, it is useful to discriminate between the two hypotheses.

2 Behavioral Hypotheses

If behavioral differences between economists and non-economists can be detected empirically, such differences could be attributed to two effects: selection and indoctrination.

> *SELECTION HYPOTHESIS*: Less pro-social persons choose to study economics. Differences in the pro-social behavior of economics students and other students are expected to be present at the onset of their studies, without their ever having attended a single lecture in economic theory.

This hypothesis is based on the notion that people differ in their pro-social preferences. With respect to their 'social value orientation' people may be divided, for example, into individualistic, competitive and cooperative types (see chapter II for a discussion of heterogeneity in individuals). According to this hypothesis, 'individualistic' types self-select into business schools, which means that observed behavioral differences would be due to this selection process and not to any effect of economics education. However, there may be another explanation for behavioral differences between economists and other students, which has more serious implications for economics education:

> *INDOCTRINATION HYPOTHESIS*: Economics students are indoctrinated by training in economics theory. It is expected that behavioral difference between economists and others increase during the studies. In other words, the more economics students learn the basis of economics, the more selfishly they behave compared to other students.

Students may, for example, take the "expected utility theory" (Von Neumann and Morgenstern, 1947) as normative advice for their own behavior (Jones et al., 1990). Due to their game theoretical education, economics students reduce their expectations about the pro-social behavior of others. This would also lead to a reduction in their own pro-social behavior as seen in chapter IV. More generally speaking, economics and business administration education decreases cooperative behavior because the training "(a) teaches a language devoid of

ethical symbols, (b) provides a set of simplified assumptions about how the world works, and (c) reinforces acceptance of the rational/economic world view" (Daboub et al., 1995: 155). If the indoctrination hypothesis proves valid, economics faculties would be educating their students to be the type of selfish persons they axiomatically assume in their theories. The two hypotheses are not mutually exclusive and have to be tested empirically.

The economics curriculum at the University of Zurich permits controlling for different levels of economic knowledge. Initially, students undertake their *basic study*, which lasts about 2 years (4 semesters). After passing an exam covering basic macro- and microeconomics and business administration theory, they enter the *main phase* of their studies and choose between economics and business administration. After graduating, students may begin their *Ph.D.* study. Some of the students gain basic economics knowledge in high school. In the analysis this *pre-university knowledge* (in economics) is controlled for.

3 Analysis and Results

The first subsection looks at the raw data, followed by an in-depth analysis of the selection hypothesis and the indoctrination hypothesis. In the following subsection, alternative hypotheses will be tested using data from the survey.

3.1 Differences Between Economists and Non-Economists: Descriptive Analysis

The raw data clearly show the differences between economists and non-economists. Table VI.1 shows the descriptive statistics for contributions by economists and non-economists who contribute to at least one fund.

Overall, 64.5% of the economists (economics and business students) contribute to at least one fund, compared to 70.2% of the non-economists. This difference is highly statistically significant (t-test: $t=16.20$, $p<0.001$). This result supports the notion that there are differences in pro-social behavior between economists and non-economists, and that the differences are quite large. To further detect whether these differences are due to a selection or an indoctrination effect, we have to look at the beginning of the students' careers at the University of Zurich and how their pro-social behavior develops throughout their studies. With respect to these questions, table VI.1 shows three interesting patterns:

Table VI.1

Contribution of Economists and Non-Economists At Different Phases of their Study

Contribution…	**Total**		**Freshmen**		**Basic**		**Main**			**Ph.D.**		
	Economics/ Business Students	Others	Economics / Business Students	Others	Economics / Business Students	Others	Econ Stud.	Business Students	Others	Econ Stud.	Business Students	Others
…to at least one fund	64.5%	70.2%	70.7%	74.5%	68.3%	71.4%	69.2%	56.8%	71.7%	65.0%	63.9%	61.9%
T-test	t=16.204 p<0.001		t=3.351 p<0.001		t=5.278 p<0.001		t=6.980 p<0.001			t=0.4003 p<0.689		
								t=23.683 p<0.001			t=1.302 p<0.193	
								t=1.620 p<0.105			t=1.306 p<0.192	
N	18,603	161,622	1688	11997	7559	32667	887	5541	90703	434	1066	27685

Note: The shaded areas indicate the columns that are compared.
Data source: University of Zurich, 1998-2002.

(1) A big difference already exists at the very beginning of the University program. Freshmen, before attending a single lecture, differ in a statistically significant way in their behavior. 74.5% of non-economists contribute, compared to only 70.7% of the economists ($t=3.35$, $p<0.001$). This result seems to support the selection hypothesis.

(2) During the main phase of their study, the pro-social behavior of economics students changes in the same way as for non-economists. The difference between economics students (69.2%) and non-economists (71.7%) is not statistically significant ($t=1.62$, $p<0.105$). For economics students, no indoctrination effect is expected based on the descriptive analysis. Only for business students does the willingness to contribute decrease dramatically. Only 56.8% contribute to the funds, while 71.7% of the non-economists behave pro-socially. The difference of 14 percentage points is statistically significant ($t=23.68$, $p<0.001$). The difference widens, thus supporting the indoctrination hypothesis.

(3) During their Ph.D. studies, the differences between business students and non-economists level off. 63.9% of business economists donate money in this stage of their studies, compared to 61.9% of non-economists. The difference is not statistically significant at a conventional level ($t=1.30$, $p<0.193$). For business students, this signifies an increase in PSB. For non-economists, a respective decrease is observed. This pattern does not fit the indoctrination hypothesis: if a possible indoctrination effect increases according to the number of semesters studied, one would expect Ph.D. students to be most affected. Economics students in their Ph.D. study do not significantly differ from non-economists ($t=1.31$, $p<0.192$).

The descriptive analysis clearly supports the selection hypothesis, while showing an unclear picture concerning the indoctrination hypothesis. For economics students no indoctrination effect can be detected by relying on the descriptive statistics. For business students, the willingness to contribute decreases but increases again for people studying for the Ph.D. However, economics students and students of other subjects may of course differ in other respects. Other factors can influence pro-social behavior besides economics and business training. For example, women are less likely to choose to study economics at the University of Zurich than other subjects (e.g. humanities). A potential ‘economics education’ effect may then be due to the gender composition of the two groups compared. To exclude such alternative interpretations, the next sections control for such factors in a multivariate regression

analysis. First the selection effect is analyzed in detail and then the indoctrination effect is studied, using methods to control for individual heterogeneity.

3.2 Selection Hypothesis

In order to test whether individuals who choose to study economics behave less pro-socially, a closer look is needed at students' first decision to contribute to the two funds. Table VI.2 presents a probit analysis, which controls for personal characteristics. The dichotomous dependent variable equals 1 if the student contributed to at least one of the two funds and 0 if the students free-ride completely. Because some students acquired economics knowledge in high school, this effect is controlled for using the dummy variable *pre-university knowledge,* which equals 1 if the students had economics in their high school curriculum and 0 otherwise. It also controls for personal characteristics: the dummy variable *gender* equals 1 for women, *nationality* is 1 for foreigners, and *age* is controlled for. As this is a pooled data set, *time dummies* control for the time when the decision was taken. Because the coefficients in a probit analysis are not easy to interpret, marginal effects are computed. They show how the probability of contribution changes compared to the reference group.

Table VI.2

Contribution of Economists and Non-Economists in the First Semester

Dichotomous dependent variable: Contribution to at least one fund (=1); Probit regression

Variable	Coefficient	Z-value	Marginal effect
Economics/Business Students (=1)	-0.133**	-3.67	-4.4%
Pre-university knowledge	-0.089**	-2.97	-2.9%
Control variables			
Gender (female=1)	-0.138**	-5.72	-4.4%
Nationality (foreigner=1)	-0.003	-0.07	-0.1%
Aged below 26	Reference group		
Aged 26-30	0.028	0.54	0.9%
Aged 31-35	0.115	1.39	3.6%
Aged 36-40	0.213	1.80	6.4%
Aged above 40	0.349*	2.61	9.9%
Constant	0.445**	14.48	
Time dummies	Yes		
N	13,685		
Log Likelihood	-7719.7007		

Notes: Reference group consists of 'non-economists', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss', ' winter semester 1998/99'.
Level of significance: * 0.01<p<0.05, ** p<0.01
Data source: University of Zurich, 1998-2002.

The results support the selection hypothesis (see also the results in chapter III). The probability that an economics student will contribute to one of the funds is 4.4 percentage points lower compared to the reference group of non-economists. The effect is statistically significant at a 99%-level. Thus, before attending a single lecture in economics, economics and business students contribute less than other students do in their first semester. The possibility that pre-university knowledge is responsible for the observed behavioral difference can be excluded. However, pre-university knowledge in economics has an effect on contributions. The probability of contributing is 2.9 percentage points lower if students acquired economics knowledge in high school. This effect can either be a selection or an indoctrination effect, but it cannot explain the economics effect. For a discussion of the control variables, see chapter III.

At the University of Zurich, students have to attend approximately two years of basic studies in economics *and* business administration. After that, they specialize in economics or business administration. Therefore, it is unknown whether the less pro-social students select economics or business administration. But, in a panel data set, it is possible to observe how students, who later choose one or the other of the two subjects, behaved in their first semester or in their basic study. Table VI.3 shows the relevant numbers for economics and business students who contributed to one of the two funds in either their first semester or the basic study. The descriptive statistic is already striking: business students behave significantly less pro-socially than economics students do. Only 60% of business students contribute when making their first decision, compared to 77% of economics students in their first semester. In the basic study on the whole, the differences remain almost as impressive: 65% of business students contribute to at least one fund, compared to 74% of economics students. Both differences are at least statistically significant at the 95%-level. Therefore, less pro-social students tend to choose business administration and not economics.

To sum up, the results show that the behavioral differences can be explained by a selection effect. In their first semester, business students contribute substantially less than non-economists do. Economics students, on the other hand, do not differ from non-economists ($t=0.385$; $p<0.700$). However, the indoctrination hypothesis also has to be tested because the hypotheses are not mutually exclusive. In the next section, it is investigated whether the behavioral differences between economists and non-economists are (also) due to their economics training.

Table VI.3

Contribution of Economics and Business Students in the First Semester

Contributions…	Freshmen Econ students	Business students	All Others	Basic study Econ students	Business students	Others
… to at least one fund	76.9%	60.1%	74.2%	73.9%	65.3%	71.1%
T-test	t=1.999 p<0.047			t=3.416 p<0.001		
		t=4.557 p<0.001			t=5.441 p<0.001	
		t=0.385 p<0.700			t=1.095 p<0.273	
N	39	203	13438	418	1914	37905

Notes: Wilcoxon-Mann-Whitney tests of the difference between economics freshmen and business freshmen: z=1.805 (p<0.071); and between economics freshmen and other freshmen: z=0.296 (p<0.767).
Data source: University of Zurich, 1998-2002.

3.3 Indoctrination Hypothesis

It may be conjectured that the more students learn about the basics of economics, such as the maximization of pay-offs, the more they personally act in a profit-maximizing way. For those students not confronted with economics theory in every lecture, such a decline in pro-social behavior should not take place. If the differences in giving behavior between economics students and students of other disciplines increase with every additional semester, the indoctrination hypothesis cannot be proven false. Table VI.1 reveals an ambiguous picture. While for economics students pro-social behavior does not change from the basic study to the main phase compared to non-economists, the contribution differential from the basic study to the main phase shows more of a decrease for business students than for non-economists – which would support the indoctrination hypothesis. But in the Ph.D. stage (economics and business) students contribute more than non-economists. If indoctrination linearly influences the behavior of students, the effect should – ceteris paribus – be most obvious at the doctoral level, where the students have absorbed the largest amount of economics training. But to test the indoctrination effect properly, two things have to be borne in mind. Firstly, business students can also differ from non-economists because of other factors that influence giving behavior (e.g. gender or age). A multivariate probit regression controls for such factors. Secondly, students in different phases of their studies can differ from each other in

unobservable time-invariant characteristics. Some do not pass the exams after the basic studies, making students in the main phase or the Ph.D. stage a special selection. It seems obvious that Ph.D. students may be an even more special selection and therefore hard to compare with general economics and business students. A conditional logit regression including individual fixed-effects controls for such unobserved personal characteristics. The two models are presented in table VI.4.

Table VI.4

Contribution of Economics and Business Students

Dichotomous dependent variable: Contribution to at least one fund (=1)

	Panel I Probit regression			Panel II Conditional logit	
Variable	Coefficient	Z-value	Marg. effect	Coefficient	Z-value
Economics and Business Students	-0.092**	-6.55	-3.3%		
Phases of study					
Freshmen	-0.025	-1.71	0.9%	-0.347**	-8.13
Main phase	0.112**	12.33	3.9%	0.166**	4.24
Main phase*Economics Students	0.093*	1.99	3.1%	-0.186	-0.71
Main phase*Business Students	-0.226**	-10.15	-8.3%	0.200*	2.04
Ph.D.	-0.023	-1.77	-0.8%	0.090	1.10
Ph.D.*Economics Students	0.165*	2.58	5.5%	-0.028	-0.05
Ph.D.*Business Students	0.179**	4.22	5.9%	0.420	1.13
Pre-University Economic Knowledge	-0.104**	-12.40	-3.7%		
Control variables					
Age	0.023**	30.90	7.9%	0.031	0.53
Age^2	-0.000**	-20.41	-0.0%	-0.000	-0.48
Gender (female=1)	-0.038**	-6.00	-1.3%		
Nationality (foreigner=1)	-0.134**	-13.87	-4.8%		
Number of semesters	-0.049**	-37.46	-1.7%	-0.118**	-4.29
Number of $semesters^2$	0.001**	23.64	0%	0.001*	4.52
Constant	0.158**	7.87			
Time dummies	Yes			Yes	
Individual fixed-effects	No			Yes	
N	180,225			74,982	
Log Likelihood	-108370.56			-27953.978	

Notes: Reference group consists of 'non-economists', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss', 'semester 1998/99'.
Level of significance: * $0.01<p<0.05$, ** $p<0.01$.
Data source: University of Zurich, 1998-2002.

Panel I in table VI.4 presents the probit estimation. The dichotomous dependent variable equals 1 if students contribute to at least one fund and 0 otherwise. The variable *Economics and Business Students* in the estimation again supports the selection hypothesis: economics and business students contribute less to the funds – independent of the phase of study. The probability is 3.3% lower than for non-economists. For economics students, both coefficients in Panel I that reflect a possible indoctrination effect, *Main Phase*Economics Students* and *Ph.D.*Economics Students*, have the wrong sign and are therefore positive and statistically significant at a 95%-significance level. This result does not support the indoctrination hypothesis.

Panel I supports the inconsistent picture with respect to the indoctrination effect for business students: moving from the basic study to the main phase of university education raises students' pro-social behavior by 4 percentage points. The coefficient of the dummy for *Main Phase*Business Students* measures the differences between business students and non-economists when entering the main phase, and hence also serves as a test for the indoctrination effect. For business students, entering the main phase of their studies lowers the probability of pro-social behavior by about 8 percentage points – in addition to the general effect for entering the main phase. This effect is statistically significant. Although this result for business students is consistent with the indoctrination hypothesis, the fact that the probability of pro-social behavior increases for doctoral students of business economics is not. The probability for business students increases about 6 percentage points, which is statistically significant at a 99%-level. As mentioned already, one would expect indoctrination to be the most marked in the Ph.D. stage, where students have accumulated the largest amount of economics training. The argument that indoctrination should be highest in the Ph.D. stage assumes, however, that doctoral students differ from other students only in the stage of the studies. But Ph.D. students are perhaps a different selection of people, which also has to be taken into account.

The results and interpretation of the indoctrination effect presented above are problematic in one respect: as already mentioned for Ph. D. students, students in the main phase of their studies can be seen as a particular selection of people compared to students in the basic study, because a large number of students fail to pass the exam enabling them to enter the main phase. Thus, a sample selection bias cannot be excluded in a probit analysis. To eliminate these doubts, the panel structure of the data set is used. The indoctrination effect is tested in a

conditional logit model with individual fixed-effects. With this method, any selection biases can be excluded by holding unobserved personal characteristics constant.

Panel II in table VI.4 presents the results of the conditional logit model with individual fixed-effects. In this type of model, because only those students are of interest who have at least once changed their pattern of decision-making with respect to contributing to the funds, the sample is reduced to 12,035 persons. These students have decided on average 6.2 times, which leads to 74,982 observations. The model used allows making intrapersonal comparisons. It looks at how individuals change their behavior when, for example, entering the main phase of studies. Of course, variables, which do not change during the course of their studies, like pre-university knowledge, gender or nationality, have to be excluded from the analysis.

The results do not support the indoctrination hypothesis. Neither of the two coefficients which would measure the effect of economics and business training on pro-social behavior shows a statistically significant effect of indoctrination. The coefficients of *Main Phase*Business Students* and of *Ph.D.*Business Students* even have the wrong sign. For business students, where the largest selection effects should be expected due to the fact that a large proportion either does not pass the exams or does not choose to carry on to Ph.D. level, the results show that it is crucial to control for unobservable time-invariant heterogeneity. In table App.VI.1 in the appendix, the results are replicated for different measurements of a potential indoctrination effect, e.g. whether pro-social behavior decreases with the number of semesters in economics or business administration.

These estimates also show that, when unobserved heterogeneity is not controlled for, the indoctrination hypothesis cannot be proven false. However, the results of the models with individual fixed-effects, which only look at intrapersonal differences, reveal another picture: economics and business education does not have a negative effect on students' willingness to contribute money to the two social funds. This can be shown by looking at the aggregate behavior of people who are observable in the basic *and* in the main study. It can then be observed whether this group of people changes its actual behavior. For economics students, 74.1% (N=451) contribute to at least one fund when they are in the basic study and 77.1% (N=367) contribute to the funds when in the main phase. The increase in pro-social behavior is, however, not statistically significant ($t=1.009$, $p<0.314$). The evidence is also very clear for business students: 64.9% (N=2150) contribute in the basic study while 67.8% (N=1919) do so in the main phase. The slight increase in pro-social behavior is statistically significant

($t=1.966$; $p<0.049$). This again shows that neither economics students nor business students change their behavior when entering the main phase of studies.

The data do *not* support a negative effect of economics education on pro-social behavior. When possible selection biases are controlled for, no indoctrination effect can be found. The effects of the probit model in table VI.4 are due to unobserved heterogeneity. Students in the main phase differ from students in the basic or the Ph.D. stage in unobserved personal characteristics. Economics students therefore do not see economic theory as normative advice for pro-social behavior.

3.4 Discussion of Alternative Hypotheses

Three alternative hypothesis will be discussed in this section: (1) economics students differ in other dimensions from non-economists (e.g. income), which may explain the observed differences; (2) economics students become more skeptical about the efficiency of the fund management and subsequently reduce their contributions; and (3) the expectations about the behavior of other people changes more dramatically for economists during their studies.

Evidence from the online survey of the student population allows addressing these three alternative hypotheses:

3.4.1 Income Situation

Economists' income may differ from students of other subjects, which may in turn explain the behavioral differences. The survey seeks to determine the income situation, assuming that the better off a student is, the more likely he or she is to help others. This hypothesis is based on empirical findings that the percentage of households that donate increases with income, while the percentage of household income devoted to giving to charity is related to income in a u-shaped way (e.g. Andreoni, 2002: 11372). However, those students working to help finance their studies (which is a significant number of students at the University of Zurich) are expected to donate less. In a recent study, students decreased their contribution in a dictator game substantially when they had to earn the money, compared to a situation where they received the money from the experimenter (Cherry et al., 2002). In contrast, when parents pay for their studies (and therefore the contribution to the funds), it is likely that students are more generous with respect to their fellow students. Thus a classical low-cost decision situation may occur (Kirchgässner, 1992).

Table VI.5 presents the probit regression which tests the influence of the income situation on giving behavior. Panel I therefore uses the survey data to replicate the estimations for actual behavior in order to see whether answers to the survey are biased. The survey results only partially replicate the results of the analysis of the real data. For example, economists report a higher willingness to donate to at least one fund while in reality they have a lower propensity to contribute. As the survey results seem to be biased, the results have to be interpreted with much care. The probability that students of economics contribute to at least one fund decreases in the main phase and increases in Ph.D. study but the differences are not statistically significant. In comparison, students of business administration give significantly less when they enter the main phase of their studies. The results also hold when controlling for the income situation, which can be seen in Panel II in table VI.5, where income variables are added. The income situation of economists cannot explain the behavioral differences between economists and non-economists.

Table VI.5

Income Factors Affecting Giving Behavior

Dichotomous dependent variable: Contribution to at least one fund (=1); probit regression

Variable	Panel I			Panel II		
	Coefficient	Z-value	Marginal effect	Coeff.	Z-value	Marg. effect
Business and Economics Students	0.061	0.50	1.6%	0.036	0.295	1.0%
Phases of study						
Main phase	0.057	0.74	1.6%	0.050	0.649	1.4%
Main phase*Economics Students	-0.431	-1.62	-13.8%	-0.362	-1.347	-9.8%
Main phase*Business Students	-0.333	-1.93	-10.3%	-0.372*	-2.146	-10.0%
Ph.D.	0.019	0.13	0.5%	0.018	0.155	0.5%
Ph.D.*Economics Students	0.404	0.60	9.2%	0.215	0.327	5.8%
Ph.D.*Business Students	0.064	0.13	1.7%	0.016	0.031	0.4%
Income situation						
Income (log)				0.207**	4.704	5.6%
Contribution (%) towards own upkeep				-0.004**	-3.135	-0.1%
Parents paying fees (=1)				-0.123	-1.645	-3.5%
Control variables						
Age	0.010	1.49	0.3%	0.006	0.754	0.2%
Gender (female=1)	0.124*	2.06	3.4%	0.138*	2.260	3.7%
Number of semesters	-0.013	-1.85	-0.4%	-0.013	-1.778	-0.3%
Constant	0.610**	3.66		-0.418	1.300	
N	2425			2425		
Log likelihood	-1191.3683			-1177.2832		

Notes: Reference group consists of 'non-economists', 'basic study', 'males', who 'pay their fees themselves'.
Level of significance: * 0.01<p<0.05, ** p<0.01.
Data source: Own survey, University of Zurich, 2000.

The influence of the income situations on pro-social behavior is mostly as expected. *Income* has a strong positive effect on the probability of contributing to the two funds. As can be seen by the coefficient of the variable *Contribution towards own upkeep*, the more a student finances his or her own living, the less he or she is willing to contribute. Surprisingly, the fact that parents pay the fees (*Parents paying fees*) decreases the willingness to contribute. The change in the contribution probability, however, is not statistically significant. Keeping in mind that the results based on the survey results are biased and not extremely stable, results of table VI.5 cannot support the first alternative hypothesis. The income situation of economics and business students cannot explain the difference between economists and non-economists.

3.4.2 Awareness of Efficient Management

Business students may critically scrutinize the fund managements' efficiency to a greater extent than other students do. With more economics and business education, this may become more pronounced. A lower contribution rate may therefore be due to a higher awareness of the shortcomings of the specialized funds. Economics and business students would then become more skeptical about the effectiveness of the funds with more economics and business education. They also increasingly substitute these particular funds with other charities. In the online survey, the students were asked, 'how do you evaluate the effectiveness of the funds?' on a scale from 8='good' to 1='bad' (with a 'no idea' option).

Table VI.6 shows that economics and business students indeed evaluate the funds in a much more critical way than others. The mean for economics and business students is 4.87 compared to 5.27 for others ($t=3.37$; $p<0.01$). The perceived efficiency decreases slightly for economics and business students in the basic and in the main phases of their studies. However, this decline is not statistically significant at any conventional level ($t=0.598$; $p<0.550$). This supports the selection hypothesis, claiming that economics and business students already differ from others at the beginning of their studies. During their studies, students do not change their attitudes much. This conclusion can be supported by analyzing answers to other questions in the same way, for instance the perceived importance of funds, or political orientation. Economics and business students are a special selection of people and education does not change these attitudes. Due to the limitation of the survey, it cannot distinguish between economics and business students in the basic study, so the evidence presented holds only for the two groups taken together. The result does not support the second alternative hypothesis. Economics and business students do not become more skeptical about the efficiency of the two funds during their studies.

Table VI.6

Perceived Efficiency of the Two Funds

'How do you evaluate the effectiveness of the funds?' (On a scale from 8='good' to 1='bad')					
	Economics and Business Students		**Other Students**		**t-test of differences**
	Mean	s.d. (N)	Mean	s.d. (N)	t-value (P>t)
Basic Study	**4.96**	1.65 (115)	**5.31**	1.62 (622)	2.15 (0.05)
Main Phase	**4.82**	1.83 (123)	**5.31**	1.80 (877)	2.79 (0.01)
Ph. D. Study	**4.56**	2.34 (16)	**4.96**	2.03 (194)	0.74[56] (0.23)
Total	**4.87**	1.78 (254)	**5.27**	1.77 (1693)	3.37 (0.01)

Notes: Without the ‚No idea' answers.
Data source: Own survey, University of Zurich, 2000.

3.4.3 Expectations About the Behavior of Others

One possible channel for the development of an indoctrination effect would be that economic training lowers expectations about the pro-social behavior of others. This in turn would lower pro-social behavior (see chapter IV about conditional cooperation). To test this development empirically in the survey, students were asked what proportion of students they expected to contribute to the two funds.[57] Although the difference in expectations between economists and non-economists seems to widen during the course of the degree, the differences are not statistically significant at any phase of studies (see table App.VI.2 in the appendix). The indoctrination hypothesis can therefore also not be supported by the shaping of expectations. Previous results about economics students' expectations are also ambiguous. While Frank et al. (1993a) find different expectations between economists and non-economists, other studies do not find statistically significant differences (Selten and Ockenfels, 1998; Yezer et al., 1996). The fact that the expectations of economists are not much shaped by economic training in the analyzed decision setting is not surprising, because people built expectations out of a real decision situation. The context of the decision situation is a crucial guide in building expectations because either metaphors are involved in their development (see e.g. Allison et

[56] The assumption for a t-test of differences is that the error term is normally distributed. However, if the number of observations is not large enough, a non-parametric test is appropriate because no assumption about the distribution of the error term has to be made. A respective Wilcoxon-Mann-Whitney test of the difference in the Ph.D. stage is also not statistically significant ($z=0.771$; $p<0.441$).

[57] The question from the online questionnaire was used here instead of the guesses in the field experiment because in the field experiment too few observations came from economics students.

al., 1996; Ortmann and Gigerenzer, 1997) or, in the field, contact with others allows for more accurate expectations (Frank, 1988: 140). In laboratory experiments students have to rely much more on theoretical concepts for developing expectations because contextual clues are excluded.[58]

To sum up, the three alternative hypotheses cannot explain differences in contributions to the two social funds at the University of Zurich. Differences in material resources, different levels of awareness of efficiency, and expectations about the behavior of others cannot explain the differences in pro-social behavior between economics students and other students. The evidence presented by the online survey supports the selection hypothesis even further, showing that business students differ right at the beginning of their studies from other students, but that business education does not change their behavior afterwards.

4 Concluding Remarks

This chapter has presented an analysis of the effect of economics education on pro-social behavior based on field evidence. Three main results can be derived from the empirical analysis. Firstly, there are behavioral differences between economists and non-economists. Economists are less prepared to behave pro-socially, i.e. to contribute to the two funds at the University of Zurich. Secondly, the differences are due to a selection effect of more selfish people into the discipline of economics. Economics training does not therefore negatively indoctrinate students. Thirdly, 'selfish' types select themselves into the study of business administration. Economics students behave as pro-socially as non-economists.

In order to interpret the results and to put them into a larger context, three remarks have to be made:

(1) The most important result of this study shows that economics education does not undermine pro-social behavior as measured by the contributions to the two social funds. The criticism that economics education produces 'bad' citizens is therefore not supported. However, the results cannot help decide whether introducing ethics courses can strengthen pro-social behavior. It may be possible that ethics courses for future leaders (for example in business schools) would have a positive effect on problems like corporate illegal

[58] If students have to think about the optimal strategy in an artificial public good situation and in a dictator game, they more often play the equilibrium strategy (Croson, 2000).

activity. The results by McCabe et al. (1994), however, do not show a positive effect of ethics courses on ethical attitudes.

(2) The results are based on a selection of people into different studies. The effect of economics education is therefore measured exclusively for students who choose to study economics. In order to analyze whether such an education has an effect on people's average pro-social behavior, people should be randomly forced to acquire knowledge in economics. However, the result that economics students do not become indoctrinated is probably more relevant than whether average people are indoctrinated by potential economics training.

(3) The evidence about the missing indoctrination effect is limited to charitable contributions. Students seem not to take basic economics theory as a normative device in such a situation. The question remains whether students in other situations rely more on their theoretical background. It could be assumed that while people's personal behavior in spontaneous situations is not affected by learned theories, when making decisions (or advising decision-makers) on more abstract situations with long-run consequences people rely on their theoretical background as a guide.[59] Economists may then stress, for example, efficiency too much over equity. Indoctrination in such situations may have even more severe effects for society. Take the example of pay-for-performance: standard economics decrees that people will undertake an effort only if the incentives are high enough. Economists ought therefore to advise decision-makers that monetary incentives will always increase effort. However, as discussed in the survey part of this thesis, monetary incentives can have detrimental effects under specific conditions, which are neglected by standard theory. If economists stick to these too simple theoretical relationships when advising decision-makers in the public or the private sphere, the outcome may be negatively influenced by economics training. However, on the one hand, results about how strictly economists would apply the price mechanism in a situation of over-demand do not give a clear picture of economics students being indoctrinated in this respect (Frey et al., 1993; Haucap and Just, 2003). On the other hand, scientists from other faculties may well provide policy advise on a particular theoretical basis which is simplified. Whether the

[59] Caplan (2002) finds systematic differences in the beliefs of economists and non-economists about the economy. For example, significantly more economists think that it is no problem for the economy if 'Top executives are paid too much'. The general public believes that this may be an important reason for why the economy is not doing better.

implications of such theories are more accurate than economics theory has to be questioned.

The results in this chapter are important, especially with respect to the recurring demand that more effort should be put into educating economics students to become good citizens. The results show that economics education does not change the citizenship behavior of the subject's students. Therefore, this branch of criticism about economics theory cannot be supported. Nevertheless, the criticism is right that economics theory is probably too simplified in various respects, which may influence the thinking of economists and their advice to decision-makers.

Chapter VII

Pro-Social Behavior and Utility: Happy Volunteers?

The preceding chapters presented evidence about the conditions under which people behave pro-socially. This chapter takes that crucial step forward and investigates whether pro-social behavior actually increases individual well-being. The question about what ultimately causes people's happiness arises throughout the history of ideas. Greek philosophers were debating about how people can and should achieve happiness. Basically two views about the pursuit of happiness have evolved: the altruistic and the egotistic. The first view emphasizes that helping others increases people's happiness. Aristotle, for example, claimed that true happiness is found in the expression of virtue. A happy person is thus a moral person. In the Enlightenment, the father of modern economics, Adam Smith, also saw helping others as *the* way to higher well-being: "Concern for our own happiness recommends to us the virtue of prudence: concern for that of other people" (Smith, 1759: 385). The second view emphasizes that people who pursue their narrow self-interest become happy. A *homo oeconomicus* who maximizes his or her utility by behaving selfishly is expected to be happier than people who accept costs to help others. The hedonistic path to pleasure and happiness for oneself leads, according to this view, to increased subjective well-being.

In the end, the philosophical question about whether sacrificing time and money to help others is rewarding and reflected in people's happiness levels, turns into an empirical question. To discriminate empirically between the two rival views on pro-social behavior and happiness, a measure of people's individual well-being is needed. Reported subjective well-being is proposed as a proxy measure for utility (see chapter II for a discussion of happiness research).

This chapter empirically investigates whether individuals who volunteer are more satisfied with their lives. The chapter concentrates on volunteer work because it constitutes one of the most important pro-social activities. In the United States, more than 50 percent of all adults volunteer, and they provide work making up an equivalent of 5 million full-time jobs. In

Europe, on average 32.1 percent of the population volunteer and offer the time of 4.5 million full-time jobs (Anheier and Salamon, 1999: 58)[60]. Many charitable organizations depend on the work provided by the large number of volunteers, and many community services only exist because people voluntarily offer their labor free of charge.

The empirical analysis of this chapter is based on the second data set analyzed in this book. Empirical evidence is presented about the relationship between volunteering and life satisfaction based on the German Socio-Economic Panel (GSOEP) for the period between 1985 and 1999. This large panel data set is one of the best available in order to study individual well-being in a longitudinal framework. Individuals are surveyed each year on various aspects of their life. In addition to questions about their socio-economic situation, participants are asked about their life satisfaction and the extent of volunteer work they provide. As in previous studies, a raw correlation is found showing that volunteers are more likely to report high subjective well-being than non-volunteers. This result, however, does not establish causality. For example, it is very likely that unobserved personality characteristics like extraversion affect volunteering as well as people's reports on their well-being. Moreover, there might be reversed causality, i.e. satisfied people are more likely to volunteer. Such causality problems have been pervasive in the literature to date.[61]

In this chapter the issue of causality is directly addressed by taking advantage of a natural experiment: the breakdown of East Germany. Shortly after the fall of the Berlin Wall but before the German reunion, the first wave of data of the GSOEP was collected in East Germany. Volunteering was still widespread. Due to the exogenous shock of the reunion, a large part of the infrastructure of volunteering (e.g. sports clubs associated with firms) collapsed and people randomly lost their opportunities for volunteering. Based on a comparison of the change in subjective well-being of these people with people from the control group who did not have to change their volunteer status, the hypothesis is supported that volunteering is rewarding in the form of higher life satisfaction. To my knowledge, this chapter

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[60] European countries included in the study are Austria, Belgium, Finland, France, Germany, Ireland, The Netherlands, Sweden, Spain, and UK. The data was collected in the years between 1995 and 1997.

[61] In the foreword to the special issue on volunteer work in *Law and Contemporary Problems,* Clotfelter (1999: 9) points out the problems of many previous studies: "Unfortunately, all of these empirical questions face a daunting methodological problem – the question of causality. If volunteers are found to have systematically different attitudes from those of non-volunteers, for example, it is by no means obvious that volunteering affects attitudes or vice versa. […] This is not to say that empirical analysis cannot uncover behavioral or attitudinal consequences of volunteering and public service participation, but only that care must be taken to distinguish correlation and causation."

presents the first analysis that is able to test for the causal relation between the extent of volunteering and life satisfaction.

In addition to the direct effect of volunteering on life satisfaction, results are reported that, conversely, a higher life satisfaction increases the willingness to volunteer. The relationship between volunteering and life satisfaction can therefore be seen as a self-enforcing process: volunteering increases subjective well-being, which again positively affects the willingness to volunteer.

The chapter proceeds as follows. Section 1 discusses the theoretical consideration about why volunteering might influence well-being as well as the results of previous research. In section 2, the second data set analyzed in this book is presented. In section 3, the empirical analysis is presented in four steps: first, the raw correlation between volunteering and reported life satisfaction is established; second, causality is tested with the analysis of the natural experiment; third, the influence of people's life goals on the reward of volunteering is investigated; fourth, the reverse causality that happy people are more likely to volunteer is analyzed. Section 4 offers a summary of the results and concluding remarks.

1 Happy Volunteers: Theoretical Considerations and Previous Research

Volunteering can positively affect individuals' well-being due to various motivational reasons, which can be roughly channeled into two groups: (1) People's well-being increases because they enjoy helping others per se. The reward is internally due to an *intrinsic motivation* to care for others' welfare. (2) People volunteer instrumentally in order to receive a by-product of volunteer work. People do not enjoy volunteering per se but their utility increases because they receive an *extrinsic reward* from volunteering.

(1) *Intrinsic motivation*. Volunteers receive an internal reward directly from their activity and/or from the outcome of the volunteer work they provide. Because people enjoy helping others, no other (material) reward is necessary to motivate them. Three intrinsic rewards can be distinguished:

a) People *care about the recipient's utility*. Due to pro-social preferences, people's utility increases either if other people become better off or if inequality between persons decreases (see chapter II for a survey on theories). For example, a person who

volunteers in an old people's home enjoys seeing the welfare of the elderly improve because somebody is caring for them. In a survey about the benefit of volunteering, 67 percent of the volunteers interviewed stated that an important source of satisfaction is seeing the result of their work (Argyle, 1999: 365). However, if seeing the outcome of volunteer work is the only reward, people should free-ride on the volunteering of others who produce the public good. Free-riders should enjoy the outcome of volunteering even more when the effort is provided by others.

b) Volunteers benefit from *intrinsic work enjoyment* (e.g. Deci, 1975; Frey, 1997). Independently of the outcome, people enjoy doing the required task per se. For example, people who volunteer for the fire service probably enjoy working in teams to fight fires with modern equipment. The task of volunteering may increase people's self-determination and feelings of competence because "[…] intrinsic motivation involves people freely engaging in activities that they find interesting, that provide novelty and optimal challenge" (Deci and Ryan, 2000: 235). In the end, self-determination and feelings of competence positively influence subjective well-being.

c) The act *of helping others gives enjoyment per se*. People receive a 'warm glow' (Andreoni, 1990) from contributing time to the provision of a public good. Independently of the outcome, the knowledge of contributing to a good cause is internally self-rewarding. This good feeling may, for example, be due to guilt reduction (Bierhoff, 2002).

(2) *Extrinsic reasons*. People may also receive utility from helping others because volunteering is extrinsically rewarding. Helping others is then secondary and direct positive feelings from helping others are absent. People volunteer 'instrumentally'; they see volunteering as an investment and expect external benefits or payoffs.

a) Volunteering can be undertaken as an *investment in human capital*. Individuals engage in volunteer activities to raise future earnings on the labor market (Menchik and Weisbrod, 1987). Especially if human capital is depreciated due to illness, childbearing or layoff, volunteering helps rebuild or maintain employment skills. Childbearing women may, for example, use such a re-entry strategy (e.g. Schram and Dunsing, 1981). People may also volunteer because community service is often the prerequisite for a position in a private or a public firm. If volunteering were

undertaken due to such extrinsic motivators, the correlation between volunteering and well-being would be due to the expected higher earnings in the future.

b) People can volunteer in order to *invest in their social network*. Through the engagement in volunteer work social contacts evolve which can be valuable for doing business or gaining employment. The expected future (material) reward is responsible for the correlation between volunteering and well-being. Politicians may, for example, not only volunteer because they enjoy helping others, but because they want to signal their good traits to the public and they expect to make valuable social contacts for their political career. However, volunteers may also enjoy social interactions without the expectation of an extrinsic reward in the future. In this case, meeting people and making friends, which both increase the feeling of relatedness, is not extrinsically but intrinsically rewarding.

The benefits from volunteering are for most people probably a mixture of the aforementioned rewards. Previous research has not been able to isolate the aspects of volunteering that are most rewarding so far. It is even still unclear whether volunteering increases people's level of well-being at all. Volunteering involves physical effort and bears the opportunity cost of time; instead of volunteering people could use the time for market work or leisure activities. With regard to empirical findings, most of the evidence so far is suggestive but not conclusive: volunteers are less prone to depression (Wilson and Musick, 1999); elderly volunteers report a positive correlation between volunteering and life satisfaction (Wheeler et al., 1998); volunteers' physical health is stronger when they become older (Stephan, 1991); and, ultimately, volunteers are found to have a lower risk of mortality (Musick et al., 1999; Oman et al., 1999).[62] Most of the research on the benefits of volunteering, however, has two shortcomings. First, many studies ask participants of volunteer programs about the benefits of volunteering. The finding that people indicate enjoyment is not surprising given that they have chosen it. Moreover, the result might be due to the fact that participants are more optimistic than average people or that they are justifying their volunteer effort. Second, most studies use cross-sectional data. Such an empirical strategy, of course does not permit any conclusion about causality whatsoever, because volunteers and non-volunteers may differ in dimensions other than volunteer status.

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[62] As volunteering is quite different from membership in voluntary associations, studies on the effect of membership on life satisfaction are not reported here. For an overview, see Wilson and Musick (1999).

Two empirical directions can be undertaken instead:

(1) The effect of pro-social behavior on subjective well-being can be investigated in the laboratory. Charness and Grosskopf (2001) and Konow and Early (2002) are two related laboratory experimental studies. In the former study based on dictator games, no relation between well-being and pro-social behavior is found. The latter study only detects a relationship between long-run subjective well-being and generosity in a dictator game. The question of causality also cannot be answered. In addition, whether pro-social behavior increases an individual's utility is difficult to measure in the laboratory because the measurement of overall well-being is explicitly designed not to be sensitive to minor life events. The low stakes involved in a laboratory experiment should therefore not be expected to influence reported life satisfaction.[63]

(2) Field studies can attempt to determine the link between pro-social behavior and subjective well-being using data better suited than in previous studies. More recent field studies use longitudinal survey data and investigate whether volunteering ten years ago has an influence on people's risk of mortality or depression scores today. The results support the view that volunteering is positively correlated with physical and mental health (for an overview, see Wilson and Musick, 1999). Thoits and Hewitt (2001) present a study which is similar to the analysis in this chapter; they use the panel structure of two waves of a US survey to estimate whether volunteering has an influence on various measures of well-being like life satisfaction, self-esteem, health and depression. To test for selection effects, the authors control for past well-being. This variable should reflect an individual's general level of reported well-being. A spurious correlation between volunteering and life satisfaction emerges if there are no controls for individual heterogeneity. The results show, on the one hand, that volunteers report higher well-being than non-volunteers and, on the other hand, that past well-being is correlated with present volunteering. However, the study can not further address the question of causality. People's well-being may have increased between the two waves due to a third factor which simultaneously increased volunteering. Volunteering is, then, not causally responsible for the increase in well-being.

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[63] A number of experimental studies interpret subjects' pro-social behavior as driven by a psychic reward. For example, Andreoni (1992) assumes that people receive a 'warm glow' feeling from pro-social acts, which can partly explain their behavior. However, he does not try to measure this feeling directly.

The empirical approach in this chapter has at least two advantages over previous studies. First, the empirical analysis relies on a large panel data set which includes many more individual observations than in other analysis and which spans a fourteen-year period including eleven waves of the survey. This panel structure makes it possible to address important selection effects due to unobserved personal characteristics. Second, a natural experiment – the breakdown of Eastern Germany – offers new possibilities for analyzing causality. An exogenous intervention randomly manipulated the extent of volunteering. This allows one to compare the well-being of people affected by the intervention with those not affected by the experiment.

2 Data Set: German Socio-Economic Panel

2.1 Survey Questions

The second data set used in this book is based on subjective measurements of pro-social behavior surveyed in the *German Socio-Economic Panel* (GSOEP).[64] In the period between 1985 and 1999, around 22,000 individuals in West and East Germany were regularly interviewed on various aspects of their lives. The survey includes standard information on socio-economic status and demographic characteristics, but it is moreover ideal for investigating the question of how pro-social behavior affects utility. In addition to general socio-economic information, the survey contains a question about the extent of volunteering, which is an important form of pro-social behavior, as well as a question about the individual's life satisfaction, which can be used as a proxy measure for utility. In the following, the features of the questions about volunteering and life satisfaction are presented.

Volunteering is captured in the GSOEP by a question included in a broader section on spare-time activities: "Which of the following activities do you pursue in your leisure time? Please indicate how often you pursue each activity. *Did you perform volunteer work?*" Individuals can answer this question on a four-point scale (4 "weekly", 3 "monthly", 2 "less frequently" and 1 "never"). Figure VII.1 shows the distribution of frequencies of volunteering based on the individuals surveyed in Germany between 1985 to 1999, who gave an answer to the question.

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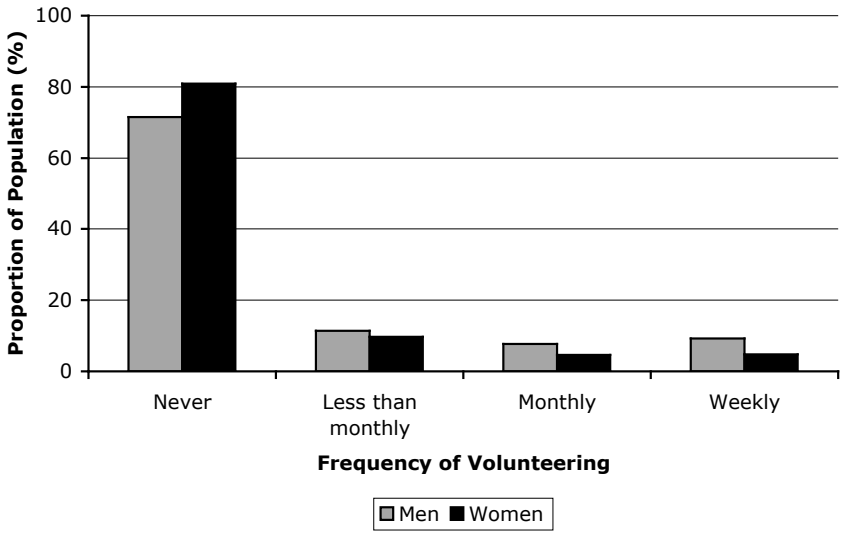
[64] For a detailed description of the GSOEP, see Burkhauser et al. (2001) and Haisken-DeNew and Frick (2001).

Figure VII.1

Frequency of Volunteering in Germany, 1985-1999



Notes: Weighted frequency based on 133'045 observations.
Source: German Socio-Economic Panel, 1985-1999.

Figure VII.1 shows that volunteering is quite a common activity in Germany: around 28 percent of all men and 20 percent of all women volunteer.[65] In total, 23 percent of the German population volunteers in one form or the other. These numbers on the extent of volunteering correspond to results from other data sets about Germany (see e.g. Anheier and Salamon, 1999). If the volunteers are divided into two groups, those who volunteer frequently ("weekly" or "monthly") and those who volunteer less frequently ("less frequently" or "never"), it turns out that 14 percent of the population volunteer frequently, while 86 percent offers volunteer work less frequently or never.

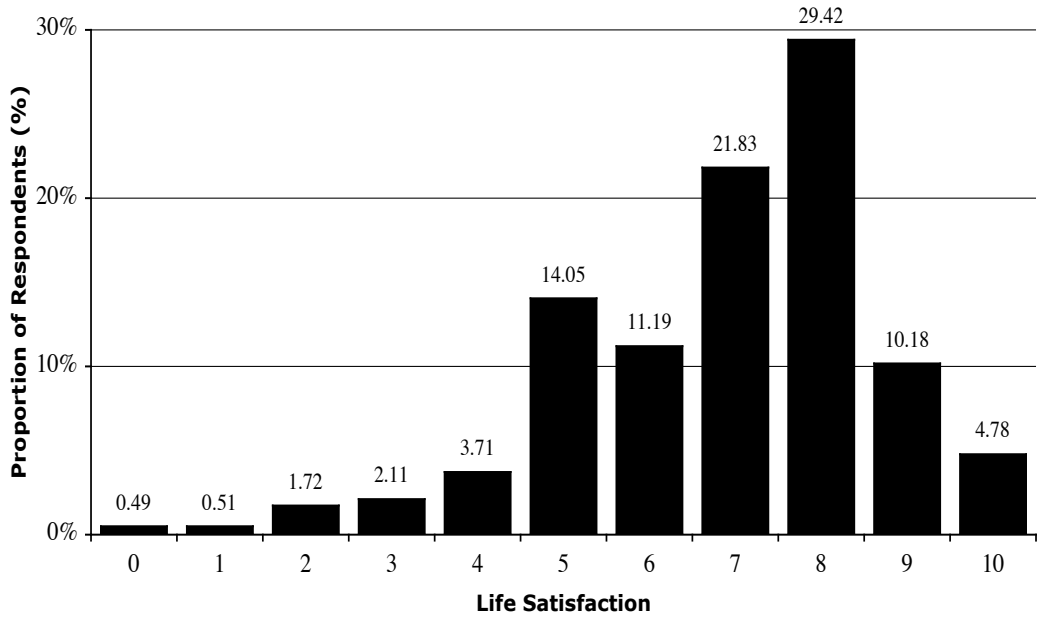
Volunteering will be related in the empirical analysis to individual utility, which can be denoted by measures of individuals' happiness or life satisfaction. The GSOEP includes a single-item question to assess life satisfaction on an eleven-point scale: "*How satisfied are you with your life, all things considered?*" Responses range on a scale from 0 "completely dissatisfied" to 10 "completely satisfied". Contrary to gloomy views, Germans seem to be on average quite satisfied with their lives. 4.78 percent of the population report being completely satisfied with life (score=10), and about 44 percent report life satisfaction in the top three categories. However, there are also about 5 percent at the bottom of the scale who fall into the

[65] Individual responses are weighted in order to get a representative distribution.

categories 0 to 3. On average, people's life satisfaction is at a level of 6.90 on the scale from 0 to 10. Figure VII.2 shows the distribution of life satisfaction in Germany for the year 2000.

Figure VII.2

Life Satisfaction in Germany, 2000



Note: Weighted distribution of life satisfaction based on 12,665 observations. 0= "completely dissatisfied", 10= "completely satisfied".
Source: Stutzer and Frey (2003a) based on German Socio-Economic Panel.

2.2 Characteristics of Data Set

For the purposes of an empirical analysis of volunteering and happiness, the GSOEP has at least two advantages over other data sets:[66]

(1) The GSOEP is a panel data set, where the same individuals are re-surveyed over time. The panel structure permits controlling for individual characteristics that do not change over time, but are systematically correlated with both reported subjective well-being and volunteering. For example, more outgoing personalities on average report higher

[66] The GSOEP represents one of the most used data sources on correlates of life satisfaction. Today, happiness researchers all around the world use the GSOEP and provide widely acknowledged scientific studies. A selection of these works are Gerlach and Stephan (1996), Winkelmann and Winkelmann (1998) and Clark et al. (2001) on unemployment; Schwarze and Härpfer (2002) on income inequality; Frijters et al. (in press) on German reunification; Lucas et al. (2003) and Stutzer and Frey (2003c) on marriage; Saris (2001) and Schyns (2000) on income; Stutzer and Frey (2003b) on commuting; Hamermesh (2001) and Frey and Benz (2002) on job satisfaction; and van Praag et al. (2003) on a wider set of domain satisfaction measures. For a broader discussion on subjective well-being in general and on measuring life satisfaction in the GSOEP, see Stutzer and Frey (2003a).

satisfaction scores; at the same time they are more likely to volunteer. Without controlling for individual heterogeneity using fixed-effects models, a spurious correlation between volunteering and reported well-being could emerge. The systematic use of panel data is an important step towards more rigorous causal inference in research on subjective well-being. However, the panel structure does not solve the causality problem. The question of causality is tackled by analyzing a natural experiment.

(2) While individuals answer a question about life satisfaction, volunteering is not salient in the GSOEP. In most other survey studies on volunteering, the whole focus is on voluntary work and the benefit derived from it. It represents a stronger test for the intrinsic reward of volunteering if the benefits are reflected in the very general measurement of subjective well-being as used in the GSOEP.

3 Analysis and Results

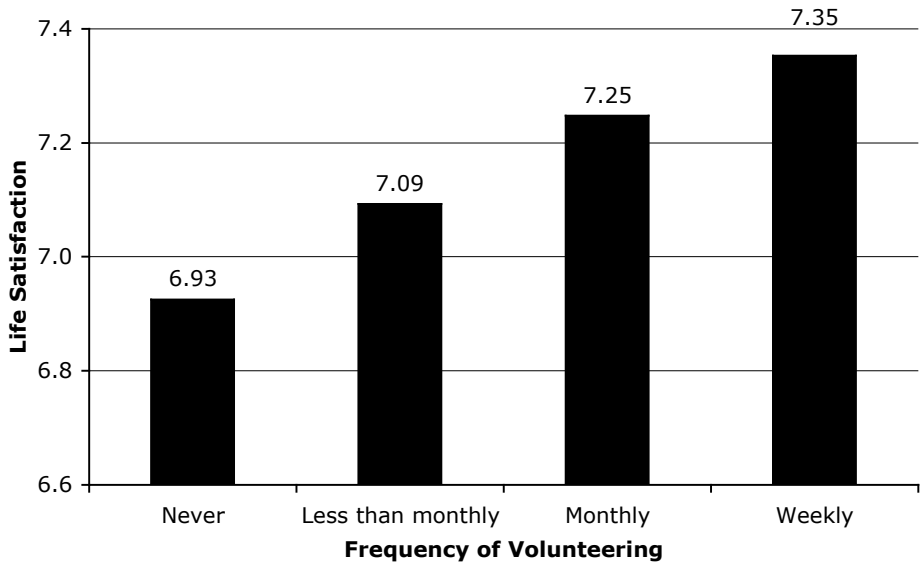
3.1 Do Volunteers Report Higher Life Satisfaction?

Figure VII.3 presents the correlation between frequency of volunteering and life satisfaction for the pooled data set. The descriptive statistics show a sizable positive relationship between volunteering and life satisfaction. People who never volunteer report on average the lowest scores of life satisfaction. For each subsequent category of more frequent volunteering a higher reported life satisfaction score appears. While people who never volunteer report an average life satisfaction of 6.93 points, people who volunteer weekly report an average life satisfaction of 7.35 points, i.e. 0.42 points higher. The difference is sizeable and statistically highly significant. Dividing people into two groups, people who volunteer weekly or monthly report, on average, being satisfied with their life at a level of 7.30, whereas people who volunteer less frequently or never report, on average, only a score of 6.95. The difference of 0.35 points is again statistically significant at the 99 percent level.

The raw correlation between volunteering and life satisfaction scores does not take into account the possibility that a third factor (e.g. financial situation) may influence both the frequency of volunteering as well as the reported subjective well-being. The positive correlation between volunteering and life satisfaction may therefore just reflect differences in socio-economic status and in the demographic characteristics of the subjects. To control for individual characteristics, a multivariate regression approach is used.

Figure VII.3

Volunteering and Life Satisfaction, Germany 1985-1999



Source: German Socio-Economic Panel.

In Table VII.1, panel A presents the relationship between life satisfaction scores, taken as the dependent variable, and the frequency of volunteering as the independent variable, with controls for a number of socio-economic and demographic variables. The four dummy variables from "never volunteering" to "weekly volunteering" capture the frequency of volunteering. In the reference group are the individuals who never volunteer. The estimation is based on an ordinary least squares model and the estimated robust standard errors are corrected for repeated observation at the individual level over time. [67] Panel A indicates that people who volunteer report a higher life satisfaction. This is especially the case for people who volunteer weekly or monthly; they report higher satisfaction scores. The differences are sizable and highly statistically significant. An individual who volunteers weekly reports, on average, a 0.30 points higher subjective well-being than somebody who never volunteers. People who volunteer monthly report, on average, a 0.27 points higher subjective well-being than the reference group. This result is consistent with the hypothesis that volunteering increases people's utility.

[67] The model chosen implicitly assumes that life satisfaction scores can be cardinally interpreted. While the ranking information would require ordered probit or logit models, comparative analyses have shown that it makes virtually no difference whether responses are treated cardinally or ordinally in happiness functions (Hamermesh, 2001; Di Tella et al., 2001). However, ordinary least squares models are easier to interpret.

Table VII.1

Life Satisfaction and Volunteering, Germany 1985-1999

Dependent variable: Satisfaction with life

	Panel A		Panel B	
	Coef.	t-value	Coef.	t-value
Never volunteering	Reference group			
Less than monthly volunteering	0.080	4.08**	-0.016	-0.98
Monthly volunteering	0.266	9.86**	0.025	1.17
Weekly volunteering	0.298	10.13**	0.080	3.43**
Household income, ln	0.313	19.75**	0.190	16.16**
No. of household members$^{1/2}$	-0.281	-9.01**	-0.214	-8.18**
Male	Reference group			
Female	0.081	4.02**		
Age	-0.051	-12.35**		
Age^2/100	0.048	10.20**	-0.010	-2.28*
Years of education, ln	0.195	3.91**	-0.292	-3.35**
Single, no partner	Reference group			
Single, with partner	0.095	2.71**	0.196	6.05**
Married	0.267	7.77**	0.271	8.39**
Separated, with partner	-0.143	-1.09	0.088	0.95
Separated, no partner	-0.563	-7.50**	-0.259	-4.64**
Divorced, with partner	0.086	1.17	0.339	5.84**
Divorced, no partner	-0.382	-6.19**	-0.072	-1.39
Widowed, with partner	0.471	3.57**	0.485	4.08**
Widowed, no partner	-0.121	-1.95	-0.175	-3.22**
Spouse abroad	-0.259	-1.59	-0.057	-0.55
No children	Reference group			
Children	-0.013	-0.56	-0.004	-0.24
Employed	Reference group			
Self-employed	-0.249	-5.33**	-0.115	-3.03**
Some work	-0.185	-4.78**	-0.172	-5.85**
Non-working	-0.161	-5.85**	-0.137	-6.81**
Unemployed	-1.011	-30.88**	-0.727	-33.30**
Military service	-0.320	-3.48**	-0.355	-4.76**
Maternity leave	0.073	1.38	-0.053	-1.19
In education	0.100	2.86**	0.031	0.95
Retired	-0.054	-1.12	-0.062	-1.83
Western Germany	Reference group			
Eastern Germany	-0.655	-27.27**	-0.353	-4.04**
Nationals	Reference group			
EU foreigners	0.146	3.85**		
Non-EU foreigners	-0.135	-4.05**		
Constant	7.088	47.37**	7.749	32.07**
Year dummies	Yes		Yes	
Individual fixed-effects	No		Yes	
No. of observations	125,468		125,468	
No. of individuals	22,016		22,016	
F-value	106.12**		91.11**	

Notes: Panel A presents an OLS regression with robust standard errors (clustered for individuals). Panel B presents an OLS regression with individual fixed-effects.
Significance levels: * 0.01<p<0.05, ** p<0.01.
Source: German Socio-Economic Panel.

The control variables in table VII.1 capture many potential differences between volunteers and non-volunteers, which could be responsible for the higher life satisfaction. The effects of the control variable are in line with results from other micro-econometric happiness functions for Germany (see e.g. Stutzer and Frey, 2003a). The regression in panel A, however, does not control for unobserved time-invariant individual differences. For example, more outgoing personalities are more likely to volunteer and to report high subjective well-being. The panel structure of the GSOEP allows controlling for such spurious correlations due to unobserved individual heterogeneity by using a model with individual fixed-effects.

Panel B in table VII.1 reports the results of the ordinary least squares regression with individual fixed-effects. Although the effects become smaller, an individual who volunteers weekly instead of never still reports, on average, a 0.08 points higher subjective well-being, while controlling for unobservable personal heterogeneity. The difference is statistically significant at the 99 percent level. The effect remains robust if volunteering is measured with a dummy variable that equals 1 for an individual who volunteers weekly or monthly and 0 for an individual who volunteers less often or never. This variable probably best captures the important difference in the frequency of volunteering, whether people volunteer often and regularly, or volunteer never or at best very seldom. People who volunteer frequently report, on average, a 0.055 points higher life satisfaction ($p<0.002$).[68]

The question of causality, however, is still open. Whether volunteers report higher life satisfaction because helping others makes people happy, or because people who have become happier start volunteering is a question that cannot be answered based on the results of the fixed-effects regressions. To address the question of causality, a situation has to be analyzed where people randomly loose the possibility for volunteering due to an exogenous shock (i.e. a natural experiment; Meyer, 1995; Besley and Case, 2000). If they report, ceteris paribus, lower life satisfaction afterwards, the effect is most likely causal. If there is no change in subjective well-being, the previous findings reflect third factors and reverse causality to a large extent.

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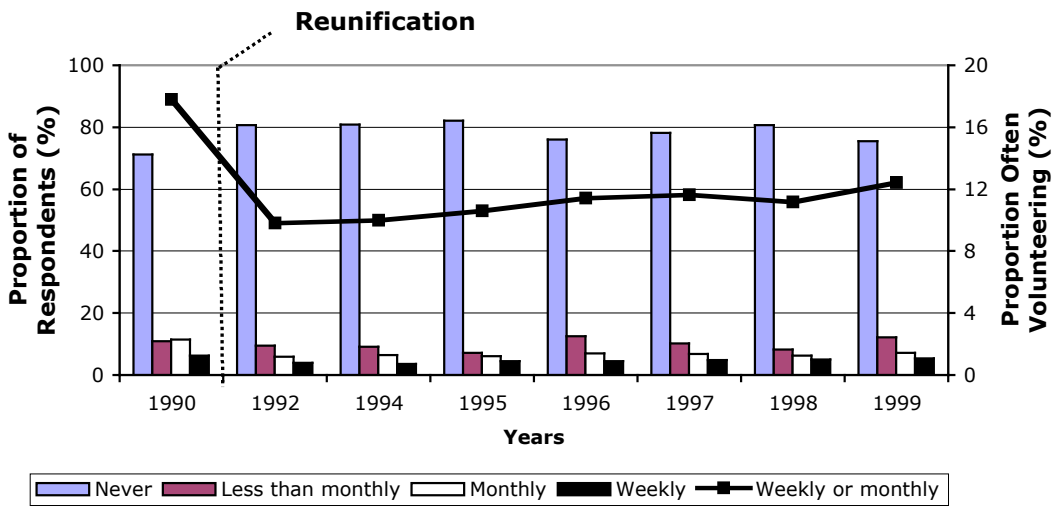
[68] The full estimation is presented in panel A of table App.VII.1 in the appendix.

3.2 German Reunification and the Abrupt Decline in Volunteering: A Natural Experiment

The German reunification constitutes an ideal natural experiment, which exogenously changed the situation for many volunteers in former East Germany. After the breakdown of East Germany, a large fraction of the infrastructure for volunteering collapsed. In East Germany, where volunteering was wide-spread, many opportunities where linked with the old structures, e.g. sports clubs were connected with nationally owned companies. Due to the reunification, these structures disappeared and many volunteers were 'forced' to stop volunteering. "With transformation, the infrastructure of volunteering lost its basis because community services in the GDR were to a large extent connected to publicly owned companies and institutions (schools etc.). Large companies in particular, as the basis and support of an infrastructure of civic engagement (e.g. in sports), disappeared with the breakdown of the GDR industrial sector, which lost two thirds of its jobs" (Gensicke, 2000: 178; my translation).

Figure VII.4

Volunteering in East Germany Before and After the Reunification



Source: German Socio-Economic Panel, 1990-1999.

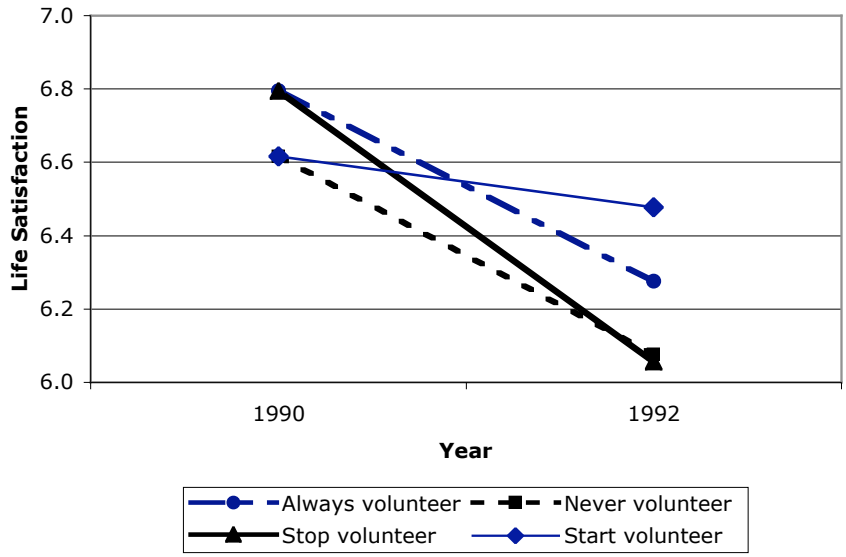
Figure VII.4 visualizes the volunteering situation in the new German Laender over time. After the fall of the Berlin Wall in 1989, the GSOEP collected the first wave of data in East Germany in 1990, before the German reunification. The extent of volunteering was substantial: 29 percent of the respondents indicated that they volunteer (scale on the left hand axis) and almost 18 percent (scale on the right hand axis) indicated that they volunteer often

('weekly or monthly'). Due to the reunification the frequency of volunteering dropped dramatically: in 1992, when people in the new German Laender were surveyed about their volunteer work for the second time, only about 10 percent of the respondents indicated that they volunteered weekly or monthly, a reduction by 8 percentage points. The collapse of the infrastructure randomly 'forced' many volunteers to stop helping others. In the following years, the amount of volunteer labor increased slowly but by 1999 had not reached pre-reunification levels of volunteering. What has the effect of this exogenous shock been on the subjective well-being of volunteers?

After the reunification, average life satisfaction decreased in East Germany (Frijters et al., 2003). If volunteering positively influences well-being, the decrease of life satisfaction is expected to be larger for people who lost their opportunity to volunteer due to the collapse of the volunteer infrastructure. Figure VII.5 compares the life satisfaction of the same people in 1990 and in 1992, as it depends on their volunteer status. The life satisfaction of people who did not volunteer frequently, neither in 1990 nor in 1992 (category = "never volunteer"), decreases to almost the same extent as for people who volunteered frequently in 1990 and were still able to carry out volunteer work in 1992 ("always volunteer"). However, volunteers report higher well-being levels in both years. For people who started volunteering between 1990 and 1992, life satisfaction increases. However, one does not know why these people started volunteering and therefore the question of causality is open. Finally, the most important group encompasses individuals who had to stop volunteering ("stop volunteer"). For them, life satisfaction decreases substantially. While the life satisfaction of people who did not change their volunteer status ("always volunteer" or "never volunteer") decreases by 0.53 points (s.e.= 0.004; N=2,839), the life satisfaction of people who had to stop volunteering decreases by 0.72 (s.e.= 0.10; N=431). The difference of -0.19 points is statistically significant at the 90 percent level (t=1.699). The life satisfaction of people who volunteered frequently in 1990 drops from the high level experienced by those who volunteer down to the level that is reported by non-volunteers. This result supports the causal interpretation that volunteering positively affects life satisfaction.

Figure VII.5

Loss of Volunteer Work and the Decrease in Life Satisfaction, 1990/92



Source: German Socio-Economic Panel.

While I am convinced that I am nearing causal inference, in the simple difference-in-difference analysis, there are at least three possible objections to the interpretation of the finding:

(1) Other factors might affect both volunteer work and life satisfaction. For example, people who become unemployed are less likely to volunteer at the same time as they report lower life satisfaction. In panel A of table VII.2, therefore, a multivariate regression is presented which includes individual fixed-effects and controls for a number of socio-economic and demographic variables. Only East Germans are included for whom the volunteer status and the life satisfaction score for 1990 and 1992 are known. People who started volunteering after the reunification (category = "start volunteer") are excluded from the estimation because their inclusion would again make causality ambiguous. As only two years are included in the model, the negative coefficient of *time dummy 1992* indicates that life satisfaction was 0.27 points lower in 1992 than before reunification in 1990, but after the fall of the Berlin Wall in November 1989. Importantly, the well-being of individuals who had to give up volunteering decreases even more when one controls for observed and unobserved individual heterogeneity. The coefficient of the variable *weekly or monthly volunteering* is statistically significant at the 95 percent level. The magnitude is comparable to the descriptive statistics: people who lost their volunteer opportunities

report a 0.23 points larger drop in life satisfaction than people who did not change their volunteer status. This result rejects the first objection and supports the causal interpretation that life satisfaction is influenced positively by volunteering.

Table VII.2

Loss of Volunteer Work and Life Satisfaction, 1990/92

Dependent variable: Satisfaction with life

	Panel A		Panel B	
	Coef.	t-value	Coef.	t-value
Volunteering less than monthly	Reference group			
Volunteering weekly or monthly	0.226	2.02*	0.231	2.00*
Socializing with friends			0.149	2.13*
Active sports			0.141	1.62
$Age^2/100$	-0.089	-1.33	-0.098	-1.45
Years of education, ln	-1.034	-0.70	-1.243	-0.82
Single, no partner	Reference group			
Single, with partner	-0.290	-0.95	-0.326	-1.05
Married	0.359	0.86	0.427	1.01
Separated, with partner	-0.559	-0.67	-0.489	-0.59
Separated, no partner	0.453	0.58	0.553	0.70
Divorced, with partner	-0.030	-0.06	0.111	0.21
Divorced, no partner	-0.246	-0.42	-0.121	-0.21
Widowed, with partner	0.750	0.58	0.691	0.54
Widowed, no partner	-0.204	-0.38	-0.375	-0.68
No children	Reference group			
Children	-0.243	-1.51	-0.287	-1.75
Employed	Reference group			
Self-employed	-0.228	-0.86	-0.275	-1.01
Some work	-0.455	-2.01*	-0.437	-1.90
Non-working	-0.227	-1.69	-0.234	-1.73
Unemployed	-0.659	-5.58**	-0.638	-5.30**
Military service	-0.866	-1.56	-0.839	-1.46
Maternity leave	-0.035	-0.16	-0.032	-0.15
In education	0.278	1.02	0.243	0.88
Retired	-0.164	-0.63	-0.134	-0.51
Constant	10.589	2.54	11.062	2.59**
Year dummy 1990	Reference group			
Year dummy 1992	-0.268	-2.17*	-0.23	-1.88
Individual fixed-effects	Yes		Yes	
No. of observations	6489		6387	
No. of individuals	3259		3257	
F-value	12.72**		11.29**	

Note: OLS models with individual fixed-effects.
Significance levels: * $0.01<p<0.05$, ** $p<0.01$.
Source: German Socio-Economic Panel.

(2) An alternative interpretation of the decrease in life satisfaction for people who no longer volunteered in 1992 could question the reason put forward for the decline in volunteering. Perhaps many individuals were not able to bear the insecurity that came with the breakdown of the communist GDR; they may then have retreated from society and become lethargic. As a result, they would have also stopped volunteering, but their lower well-being would be caused by their retreat from society. There are, however, at least two counter-arguments. First, it is known that many volunteers did not give up because they retreated from society but because the institution for which they used to volunteer disappeared after reunification.[69] Second, in panel B of table VII.2 two other spare-time activities (*socializing with friends* and *active sports*) are included as control variables. The dummy variables take the value 1 if people report that they socialize weekly or monthly (or actively engage in sport) and 0 otherwise. The results indicate that people report higher life satisfaction if they frequently socialize and do sports than if they are inactive with respect to these two activities. If the 'retreat from society' interpretation were partly right, the inclusion of the two variables for spare-time activities should lower the effect of volunteering. Although both variables, socializing and active sports, have the expected positive effect on life satisfaction, the effect of volunteering is not affected. Volunteering has a robust independent influence on life satisfaction.

(3) Another interpretation of the effect could speculate that people who were engaged in voluntary work in the GDR were connected to the old political system. After the breakdown of the GDR, they lost not only their voluntary work but primarily their connection with the regime. It could be imagined that this would have resulted in a loss of status and perspectives for the future. The empirical validity of this interpretation is analyzed by considering the answer to a question posed in 1990 about individuals' satisfaction with the GDR: "The following questions deal with the situation in the GDR: All in all, how satisfied or dissatisfied are you with democracy as it exists in the GDR today?" People could answer on a four-point scale (1=very satisfied, 2=satisfied, 3=dissatisfied, 4=very dissatisfied). The question allows one to analyze whether the effect of volunteering only applies to people who were more or less satisfied with the regime. The empirical analysis shows

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[69] The Enquete-Commission of the German Bundestag on the 'Future of Civic Activities' concludes in their report: "More than 37 percent of all the volunteers in the GDR stopped their volunteer work between 1989 and 1991. 50 percent reported that they stopped volunteering due to the termination of groups and organizations which had previously provided opportunities for civic engagement, i.e. social mass organizations or publicly owned firms" (Enquete-Kommission, 2002: 226; my translation).

that the effect on life satisfaction of stopping volunteer work is the same for people who were more or less satisfied with democracy in GDR (-0.74 points) and for people who were more or less dissatisfied with the situation (-0.70 points). If different regressions are run for the sub-samples which are satisfied and dissatisfied with the democracy in the GDR, then the effect of volunteering is even higher for people who are more or less dissatisfied with the regime (see table App.VII.2 in the appendix). This result does not support the interpretation that people who were in support of or supported by the regime lost the most when volunteering opportunities decreased with reunification.

In sum, the breakdown of the GDR constitutes a unique natural experiment for analyzing the causal effect of volunteering on people's utility. The results indicate that volunteering does increase happiness. The results are robust even with controls for other factors that influence life satisfaction, like unemployment status or other leisure activities.

How does this result fit with the claim that volunteering in the communist state of East Germany was not always purely voluntary? It can be imagined that engagement in some sort of community service was demanded from a good citizen and loyal party member. How can one explain that people who might have been 'forced' to volunteer become unhappy when they no longer have to volunteer? Firstly, the extent of voluntary community service is probably underestimated. In addition to 'official' volunteering, many forms of voluntary community service were known (Gensicke, 2000). Secondly, the fact that people who were partly required by the system to volunteer still receive a psychic reward is even stronger support for the hypothesis that helping others is rewarding. It could be interpreted from this that even people who volunteer instrumentally to attain a certain job or receive social recognition will profit from volunteering. This would contradict the conclusion that "[…] there can be little doubt that these benefits are usually unintended consequences of behavior that is motivated not by extrinsic but intrinsic rewards" (Wilson and Musick, 1999: 167). Much more research is needed to investigate the conditions under which the benefits of volunteering become more or less pronounced. As a first step, the next section presents results about who profits the most from volunteering: people who pursue intrinsic life goals or people with extrinsic goals.

3.3 Who Benefits the Most from Volunteering?

People have different life goals. While some people are more extrinsically oriented ('materialists'), other people put more emphasis on intrinsic life goals. Materialists believe that acquisition and possession are central means to achieving happiness (e.g. Tatzel, 2002 for

a discussion in economics). In contrast, people with intrinsic life goals emphasize personal growth, relationships and community spirit as important sources of well-being. Naturally, the question arises whether one set of goals brings more life satisfaction. The research in psychology about this question concludes that 'All Goals Are Not Created Equal' (Ryan et al., 1996), meaning that people with more materialistic goals are less happy than people who pursue intrinsic life goals (see e.g. Kasser and Ryan, 2001). Applied to pro-social behavior, one could expect that such a 'hedonistic paradox' occurs because people who are materialistically oriented do not help others and therefore do not benefit from the internal rewards of pro-social behavior (Konow and Earley, 2002; Phelps, 2001). As a result, people who pursue their own happiness are not as happy as those who care for others.

This claim is tested in the GSOEP with a focus on volunteering. In two waves of the GSEOP, people were asked, "How important for your well-being and satisfaction is …?" They rated inter alias the following areas: family, friends, income, and career success on a four-point scale. The first two areas are defined as intrinsic and the last two as extrinsic. For each person in the sample, the relative importance of extrinsic over intrinsic life goals is calculated, assuming a cardinal scale. This variable is standardized around the mean and a proxy for the importance of extrinsic goals is derived with a mean of 0 and a standard deviation of 1. The higher the value of the variable, the more weight is given to extrinsic goals. The analysis of the relation between life goals and the effect of volunteering on life satisfaction leads to three interesting results:

(1) People who give greater weight to extrinsic goals relative to intrinsic goals are less satisfied with life. If individuals are divided into two groups around the median, people who place above-median importance on extrinsic aspects of life report on average a life satisfaction score of 6.8; people below the median report a higher score of 7.2 points. The difference of 0.4 point is statistically significant on the 99 percent level. This result for Germany replicates the aforementioned results in psychology that people who pursue extrinsic goals are less satisfied with their life than people who focus on intrinsic life goals. Frey and Stutzer (2003b) present one possible explanation for this result: more extrinsically oriented people may have a greater tendency to err when predicting future utility from various activities. They may focus too much on extrinsic attributes of activities and put too much effort into gaining income and status, while underestimating intrinsic attributes of their choice options. It follows that more extrinsically oriented

people would devote too little time helping others. The next two results are consistent with this interpretation.

(2) Volunteers on average rate intrinsic goals as more important than extrinsic goals. People who volunteer weekly or monthly have on average a score of –0.015, whereas people who volunteer less frequently or never have an average score of 0.002. The difference is statistically significant on the 95%-level. Not surprisingly, intrinsically oriented people are more prepared to volunteer. However, more extrinsically oriented people also volunteer, but they may do so for different reasons. These people may volunteer more instrumentally, i.e. in order to increase the probability of receiving a good job or developing a political career. For the intrinsic benefits from volunteering such differences in motivation could be important, as indicated by the third result.

(3) People who are more extrinsically oriented benefit less from volunteering than people who place more importance on intrinsic life goals. In panel A of table VII.3, besides the dummy for volunteering weekly or monthly (=1) or less frequently or never (=0), a variable for the *relative importance of extrinsic goals* is incorporated, along with the interaction variable between the dummy for *volunteering* and the *relative importance of extrinsic goals*. The coefficient for the variable *relative importance of extrinsic goals* supports the aforementioned first result in a multivariate regression: the more people are extrinsically oriented, the less satisfied they are with their lives. The interaction term indicates that people who pursue more extrinsic goals benefit less from volunteering. As the variable for the relative importance of extrinsic goals is standardized around the mean, the interaction term indicates that people who are one standard deviation more extrinsically oriented benefit 0.08 points less from volunteering in terms of life satisfaction. The latter result is robust to a specification with individual fixed-effects which controls for unobserved time-invariant differences between people (panel B of table VII.3). The effect of volunteering is positive, which is indicated by the positive and significant effect of *Volunteering*. If separate regressions are run for the highest and the lowest quartile in terms of the importance of extrinsic goals, the result becomes even clearer. For the quartile of people who are the most intrinsically oriented, weekly or monthly volunteering increases their life satisfaction, on average, by 0.09 points (s.e.=0.036). For the quartile of people who are the most extrinsically oriented, volunteering even decreases life satisfaction, on average, by –0.02 points (s.e.=0.03). The latter coefficient is not statistically

significant at any conventional level.[70] It can therefore be concluded that intrinsically oriented people receive more benefits from volunteering than extrinsically oriented volunteers.

The differences in the benefits from volunteering between extrinsically and intrinsically oriented individuals can be interpreted as an indication that the motivation for volunteering matters. People who volunteer out of intrinsic motivation receive a higher psychic reward from helping others than people who volunteer instrumentally. Alternatively, different characteristics of volunteer tasks may also be responsible for the different benefits. More extrinsically oriented people, for example, may volunteer for a political organization, while intrinsically oriented people may volunteer in an old people's home. More research is needed to better understand which volunteer tasks are most rewarding and how such differences can be explained.

[70] The full results of the estimations are presented in panel B and panel C of table App.VII.1 in the appendix.

Table VII.3

Intrinsic/Extrinsic Life Goals and the Effect of Volunteering on LS

Dependent variable: Satisfaction with life

	Panel A		Panel B	
	Coef.	t-value	Coef.	t-value
Volunteering less than monthly	Reference group			
Volunteering weekly or monthly (=1)	0.233	9.93**	0.037	2.07*
Relative importance of extrinsic goals compared to intrinsic goals	-0.130	-9.50**		
Volunteering * relative importance of extrinsic goals compared to intrinsic goals	-0.078	-3.47**	-0.048	-2.52*
Household income, ln	0.406	20.48**	0.249	16.91**
No. of household members$^{1/2}$	-0.324	-9.33**	-0.263	-9.51**
Male	Reference group			
Female	0.025	1.14		
Age	-0.057	-12.16**		
Age^2/100	0.053	9.95**	-0.004	-0.86
Years of education, ln	0.142	2.60**	-0.282	-3.17**
Single, no partner	Reference group			
Single, with partner	0.085	2.32*	0.205	6.21**
Married	0.232	6.23**	0.258	7.83**
Separated, with partner	-0.067	-0.49	0.147	1.52
Separated, no partner	-0.513	-6.39**	-0.222	-3.84**
Divorced, with partner	0.090	1.17	0.349	5.89**
Divorced, no partner	-0.336	-5.11**	-0.078	-1.46
Widowed, with partner	0.462	3.06**	0.545	4.26**
Widowed, no partner	-0.146	-2.11*	-0.182	-3.20**
Spouse abroad	-0.342	-1.65	-0.035	-0.29
No children	Reference group			
Children	0.017	0.70	0.022	1.17
Employed	Reference group			
Self-employed	-0.239	-4.75**	-0.117	-3.02**
Some work	-0.222	-5.47**	-0.186	-6.14**
Non-working	-0.206	-6.75**	-0.119	-5.64**
Unemployed	-0.979	-28.57**	-0.718	-31.88**
Military service	-0.286	-3.02**	-0.340	-4.39**
Maternity leave	0.055	1.03	-0.043	-0.96
In education	0.044	1.14	0.023	0.67
Retired	-0.126	-2.35*	-0.076	-2.12*
Western Germany	Reference group			
Eastern Germany	-0.613	-24.59**	-0.357	-4.12**
Nationals	Reference group			
EU foreigners	0.093	2.10*		
Non-EU foreigners	-0.161	-4.35**		
Constant	7.262	44.95**	7.489	30.18**
Year dummies	Yes		Yes	
Individual fixed-effects	No		Yes	
No. of observations	108,115		108,115	
No. of individuals	16,206		16,206	
F-value	108.20**		87.19**	

Notes: Panel A presents an OLS regression with robust standard errors (clustered for individuals). Panel B presents an OLS regression with individual fixed-effects.
Significance levels: * 0.01<p<0.05, ** p<0.01.
Source: German Socio-Economic Panel.

3.4 Reverse Causality: Happiness Influences the Extent of Volunteering

The results in the sections above support the argument that volunteering causally increases well-being. However, the reverse causality that happier people are more willing to help others may still apply, as the two causal directions are not mutually contradictory. This section analyses whether part of the relation between happiness and volunteering can be explained by this reverse causality.

The level of subjective well-being can influence the extent of volunteering in basically two respects.[71] Firstly, happiness may lower the marginal effort costs of volunteering. Happiness would then increase productivity and happy people would exhibit higher job performance. Secondly, happiness can increase the marginal benefit from volunteering. For example, according to theories of inequality aversion (Fehr and Schmidt, 1999), people who experience an above-average utility (happiness) level try to reduce the inequality by helping others. The act of helping others may be more intrinsically rewarding the better off you are in terms of happiness. A number of studies were able to observe a correlation between happiness and helping others (Thoits and Hewitt, 2001) or between happiness and ethical attitudes (James, 2003). In experimental studies, mood was manipulated by letting people find a coin or letting them win in a game. Once a good mood had been induced, people were more likely to help others in comparison to a control group (Isen and Levin, 1972; Harris and Smith, 1975).

While there is experimental evidence for the existence of a causal relation, as far as I am aware of there is only one study that addresses causality issues using field data (Thoits and Hewitt, 2001). Field data, however, is important for measuring the quantitative importance of effects. It is therefore worth measuring the effect of happiness on volunteering for the GSEOP. I also want to illustrate the methodological difficulties in this kind of analysis, in which a summary measure of people's well-being is used as a regressor.

The empirical analysis starts from a standard supply function of volunteer labor for Germany. The details of the supply function are shown in table App.VII.3 in the appendix. Results are in line with previous research (e.g. Menchik and Weisbrod, 1987; Freeman, 1997). Contrary to the predictions made by standard economic theory, volunteers have characteristics which are associated with a high value of time. In terms of the effects for the whole population, the

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[71] For a formal economic model on how mood, emotions or feelings might influence decision-making, see Hermalin and Isen (2000). For a survey on empirical evidence for the influence of affect on decisions, see Isen (2000).

probability of volunteering increases significantly with an increase in household income, age and years of education. The probability is significantly lower for women, unemployed people, those living in former East Germany and foreigners. However, some results are consistent with the notion that people with high opportunity cost of time volunteer less: people who work only part-time are more likely to volunteer than employed individuals. Results for working time are inconclusive.[72] In a next step, proxies for life satisfaction are introduced into the supply function as independent variables.

Table VII.4

Supply Functions for Volunteer Work and Life Satisfaction, Germany 1985-1999

Dependent variable: Volunteering monthly or weekly (=1), less frequently or never (=0)

	Panel A		Panel B	
	Marginal effects	z-value	Coefficient	z-value
LS Score 0	-0.045	-3.07**	-0.301	-1.25
LS Score 1	-0.044	-2.62**	-0.393	-1.53
LS Score 2	-0.015	-1.49	-0.285	-1.93
LS Score 3	-0.012	-1.62	-0.228	-2.21*
LS Score 4	-0.007	-1.17	-0.082	-0.92
LS Score 5	Reference group			
LS Score 6	0.013	2.99**	0.006	0.11
LS Score 7	0.021	4.99**	0.008	0.15
LS Score 8	0.039	8.81**	0.043	0.82
LS Score 9	0.052	9.14**	0.036	0.56
LS Score 10	0.045	6.46**	0.149	1.99*
Control variables	Yes		Yes	
Year dummies	Yes		Yes	
Individual fixed-effects	No		Yes	
No. of observations	125,468		36,811	
Log likelihood	-45738.129		-13561.119	

Notes: Panel A: probit regression with robust standard errors (clustered for individuals). Panel B: conditional logit model with personal fixed-effects. For control variables, see table App.VII.3 in the appendix.
Significance levels: * 0.01<p<0.05, ** p<0.01.
Source: German Socio-Economic Panel.

In panel A of table VII.4, reported life satisfaction (LS) scores are added to the supply function for volunteer work. The dependent variable of the probit model is dichotomous, taking the value 1 if people volunteer weekly or monthly and 0 otherwise. As life satisfaction is reported on an *ordinal* eleven-point scale, dummy variables for every category are incorporated. The reference group is constituted of people who report a life satisfaction score of

[72] Psychologists have been investigating the determinants of volunteering for decades. For a useful survey, see chapter 20 and 21 in Bierhoff (2002).

five. The results are consistent with the notion that happier people are more likely to volunteer. People who report a higher life satisfaction than the reference group are statistically significantly more likely to volunteer, whereas people who report lower life satisfaction than the reference group are less likely to volunteer. For example, for people with highest life satisfaction, the probability to volunteer is 4.5 percentage points higher than in the reference group. Conversely, individuals who report the lowest life satisfaction score are 4.5 percentage points less likely to volunteer than the reference group. In order to account for unobservable time-invariant individual factors, a conditional logit model with fixed-effects is estimated. The results in panel B of table VII.4 support the notion that happy people are more likely to volunteer. A test of the joint significance of the dummies for life satisfaction shows that life satisfaction is correlated with the decision to contribute time to public goods ($\chi^2(10)=18.76$; $p<0.0434$); an increase in life satisfaction is associated with a higher probability of volunteering. Causality is ambiguous, however, even in the specification which controls for unobservable individual fixed-effects.

As in the first part of this chapter, where a case for a causal relation between volunteering and life satisfaction is made, special attention should be given to the question of causality. To infer causality, a variation in life satisfaction would have to be observed that is not connected to volunteering. This would ideally be a positive or negative life shock which increases (or decreases) life satisfaction without having an independent influence on volunteering. In table VII.5 a two stage least squares (2SLS) model is presented which uses different life events which have positive respectively negative effects on life satisfaction as instruments to explain life satisfaction. The chosen life events (marriage, unemployment, divorce and death of spouse) affect life satisfaction before and after the event (Clark et al., 2003). The year before and after the event are used as additional factors to explain life satisfaction, i.e. as instrumental variables. The results of the 2SLS regression in table VII.5 indicate that part of the correlation between volunteering and life satisfaction can be explained by life satisfaction influencing volunteering.

Table VII.5

Volunteering and Life Satisfaction, 2SLS Regression

Dependent variable: Volunteering monthly or weekly (=1), less frequently or never (=0)

	Coefficient	t- value
Life satisfaction	0.042	4.28**
Work time	-0.001	-1.88
Work time^2/100	0.000	1.25
Work time n.a.	-0.027	-2.08*
Household income, ln	-0.006	-1.35
No. of household members$^{1/2}$	0.054	8.32**
Male	Reference group	
Female	-0.071	-17.20**
Age	0.008	9.73**
Age^2/100	-0.0001	-9.00**
Years of education, ln	0.126	11.38**
Single, no partner	Reference group	
Single, with partner	-0.050	-6.98**
Married	-0.019	-2.67**
Separated, with partner	-0.062	-2.98**
Separated, no partner	0.007	0.49
Divorced, with partner	-0.067	-5.48**
Divorced, no partner	0.0002	0.02
Widowed, with partner	-0.082	-4.13**
Widowed, no partner	0.010	0.95
Spouse abroad	0.006	0.35
No children	Reference group	
Children	-0.004	-0.79
Employed	Reference group	
Self-employed	0.015	1.28
Some work	0.059	5.76**
Non-working	-0.0002	-0.05
Unemployed	-0.0003	-0.43
Military service	-0.022	-1.29
Maternity leave	-0.046	-4.38**
In education	0.023	2.39*
Retired	-0.015	-1.40
West Germany	Reference group	
Eastern Germany	-0.023	-2.82**
Nationals	Reference group	
EU foreigners	-0.089	-14.21**
Non-EU foreigners	-0.089	-17.24**
Year dummies	Yes	
Constant	-0.611	-8.29**
No. of observations	125,468	
F-value	38.74**	

Notes: 2SLS regression with robust standard errors (clustered for individuals). First-stage regression: Life Satisfaction= 0.243(t-value=4.86) year after marriage 0.364(7.18) year before marriage – 0.107 (-2.51) first year unemployed – 0.476 (-13.06) year before unemployment - 0.088 (-1.20) year after divorce - 0.295 (3.75) year before divorce – 0.578 (-9.06) year after death of spouse – 0.308 (-4.13) year before death of spouse + all other control variables. Adj. R^2=8.18.
Significance levels: * 0.01<p<0.05, ** p<0.01
Source: German Socio-Economic Panel.

However, the applied instrumental variable approach has various problems that are inherent to any attempt at finding an instrument for life satisfaction. Life satisfaction is not sensitive to minor life events; this means that if an event is reflected in life satisfaction, it is most likely to influence other life areas as well (e.g. the extent of volunteering). It is therefore almost impossible to find a convincing instrument for life satisfaction. The above mentioned results which find that happiness influences the will to help others, therefore, has to be interpreted with a great deal of caution.

4 Concluding Remarks

Helping others increases people's individual well-being. This result is derived from an investigation based on volunteer work and reported subjective well-being for a large panel data set for Germany. People who volunteer frequently are more likely to report high life satisfaction than non-volunteers. The reunification of Germany constitutes an ideal natural experiment for investigating the causality of the relationship between volunteering and happiness. Because of the huge change in civil and firm infrastructure many randomly hit volunteers lost their opportunities for engagement. As a result, these people's well-being decreased compared to a control group for which the volunteer status remained unchanged. The result is robust to the introduction of various control variables and to the control of time-invariant individual heterogeneity.

The basic result of this study, that volunteering is rewarding for the subjects in terms of higher life satisfaction, can to be qualified in at least two respects. Firstly, people who put more importance on extrinsic life goals relative to intrinsic life goals benefit less from volunteering. This may be due to the fact that volunteering is not internally rewarding if people volunteer instrumentally in order to achieve a (material) reward like a better job. Another possibility is that more extrinsically oriented people are engaged in different volunteer tasks than intrinsically oriented people, and the benefits may depend on the task. Secondly, the results in this study support not only the notion that volunteering influences happiness but evidence is also presented for the reverse causation: Happy people are more likely to volunteer. The two causal directions are not mutually contradictory and can be interpreted as an indicator of a self-enforcing process. Volunteering increases happiness, which again increases the likelihood of volunteering.

There may be several mechanisms that mediate between volunteering and happiness. One possible channel is that volunteering primarily influences the self-actualization of people (see the experiment in Konow and Earley, 2002). The process of self-actualization then increases intrinsic motivation (crowding-in), while it positively influences subjective well-being. This mechanism is, however, very sensitive to institutional conditions. As volunteering does not directly influence well-being, the process of self-actualization is important for the benefits of volunteering. External interventions can, then, interrupt the influence of volunteering on self-actualization and lead to a crowding-out of intrinsic motivation (Frey, 1997). Volunteering in itself would not be rewarding in such a setting.

The results presented in this chapter point to two open questions for future research:

(1) The question remains why not all people volunteer in order to increase their life satisfaction. Many people seem to fail to increase their utility because they are not engaged in volunteering. My favorite explanation is based on a theory of people mispredicting future utility (Frey and Stutzer, 2003b). People make mistakes in predicting utility by weighting future activities asymmetrically; i.e. they underestimate the benefits from intrinsic tasks like volunteering, while they overestimate the value of something like additional income from overtime work. Future research should investigate whether people really underestimate the internal reward to be had from volunteering.

(2) Under which institutional conditions is volunteering rewarding? If volunteering is required by private and public firms as a prerequisite to being hired, does volunteering still increase well-being? Or may the motivation for volunteering be crucial for the benefit; i.e. if volunteering is used instrumentally, will the internal reward be small? Or do the incentives lead to a crowing out of intrinsic motivation (Frey, 1997)? The results in this chapter are inconclusive about this point. The evidence from East Germany, however, is consistent with the view that even people who are required to volunteer receive an internal reward. In contrast, a study by Stukas et al. (1999) shows that forcing people to volunteer decreases their intention of undertaking future voluntary work. This could be interpreted as meaning that mandatory volunteering decreases the internal reward from the task. But these results have to be based on more solid empirical results. The challenge is thus to understand the institutional conditions under which voluntary work remains rewarding in itself.

Chapter VIII

Concluding Remarks

The theoretical and empirical analysis in this book produces good and bad news for individuals living together in social groups. The good news is that the prospect of people behaving pro-socially does not look as gloomy as is often predicted by economic theory. People deviate systematically from the self-interest hypothesis by contributing money and time to public goods. The bad news is that they not always do so. In certain situations people are not willing to contribute to a good cause and hence the public good is not provided in a socially optimal amount. The important analytical step forward is therefore to isolate the conditions which lead to more and to less pro-social behavior. The empirical part of this thesis presents field evidence about the conditions which affect the willingness to contribute money and time to a public good. In the following, the good and the bad news are developed, leading to a consideration of their importance for economic theory and for policy.

Good News: People deviate from the self-interest hypothesis and are willing to behave pro-socially in various settings. The empirical analysis presented in this study is consistent with the findings of previous studies that people are willing to contribute to public goods. Even in an anonymous setting, in which neither selective incentives (e.g. a private good or prestige) nor social pressure can explain contribution behavior, students at the University of Zurich are prepared to donate money to a charity. In contrast to laboratory experiments, the willingness to contribute does not deteriorate dramatically over time.

The empirical section about volunteering offers an interesting explanation for the extent of pro-social behavior, namely that helping others makes people happy. Based on a large-scale survey data set for Germany, it is shown that people receive an internal reward from contributing time to a public good, which is then reflected in their life satisfaction. By investigating a natural experiment which exogenously manipulated the extent of volunteering, the causal relationship between volunteering and life satisfaction can be established for the first time. Adam Smith was probably right when he stated that "[c]oncern for our own happiness recommends to us the virtue of prudence: concern for that of other people" (Smith, 1759: 385).

Two questions remain open. Firstly, if volunteering enhances people's welfare then why do more people not do it? In order to answer this question, one has to accept that people make systematic errors in their decisions. People may mispredict the future utility they get from behaving pro-socially and as a consequence they do not engage in voluntary work. Instead, they opt, for example, for working more in their paid job. Secondly, can people be forced to become happy volunteers? There is a strong intuition that 'mandatory' voluntarism gives lower satisfaction than free-will engagements. But the claim needs to be empirically supported that the utility people receive from contributing to a public good is sensitive to the environment. In this sense, the motivational crowding-out effect of monetary incentives could be directly tested. To 'force' people to behave pro-socially with extrinsic incentives can lead to a crowding-out of the intrinsic joy of giving.

Bad News: The extent of pro-social behavior varies with the conditions under which the decision takes place. The bad news arising from the evidence presented in this thesis is that people are not always prepared to behave pro-socially. There is a large variance in pro-social behavior. A range of explanations of this variation in contributions is provided by numerous theoretical approaches presented in the survey section. The most promising theories import ideas from psychology or sociology and thereby enrich the economics view of human behavior. The empirical results presented in this book highlight four important conditions for pro-social behavior.

(1) *Framing effects*. People's pro-social behavior depends to a large extent on institutional framing effects. Small variations in the framing of the decision lead to large behavioral effects. For the decision to contribute money to two charities at the University of Zurich, a minor change in the mode of asking had a tremendous effect on pro-social behavior. The exact mechanism for framing to be effective is still underexplored by economics. The frame of the decision probably contains information about the social norms of contributing and therefore also about the expected intentions of the people involved. On the other hand, the frame (or procedure) of a decision can be perceived as fair or unfair, which influences one's willingness to behave pro-socially.

(2) *Conditional cooperation*. The willingness to behave pro-socially is conditional on the behavior of the reference group. I do not find any evidence that people free-ride on the behavior of others, as expected by pure altruism models; rather, they increase their contributions if the average group contribution increases. As such, social interaction effects are hard to test without an exogenous intervention. In this thesis, the first field experiment

was implemented which can systematically address the question of how people react to charitable giving by others. The results show that people who were informed that many others contributed to the two social funds increased their contribution. The most sensitive individuals to social interaction effects are those with neither a very strong nor a very weak preference for contributing to the two funds. For these types of persons the information of what other do seems to be more important.

The reason why people vary their individual behavior with group average behavior has still to be further investigated. Future research should try to discriminate between various theoretical explanations and investigate the conditions under which various explanations are most accurate. From the results of the field experiment it is also not conclusive how much a low contribution rate erodes pro-social behavior. The results can be interpreted as meaning that people do not stop contributing when informed that only a minority is behaving pro-socially. That would imply that either cooperation does not collapse when a majority is free-riding or that people have even lower expectations about the behavior of others than assumed. The relevant question remains about the conditions under which the behavioral reaction leads to an equilibrium with very low pro-social behavior and when such a cascade does not happen.

(3) *Monetary incentives*. The price of acting pro-socially has an effect on people's behavior. In order to test the effect of monetary incentives, the contributions of the students were matched by 25 or 50 percent in a field experiment, which reduced the price of giving. The effect of the field experiment is mostly in line with economic reasoning. For people who are pro-socially inclined, the matching mechanism has the expected effect, but only when the amount matched is large enough. The matching mechanism has no effect on people who never contributed in the past. This result is consistent with the notion that it is extremely difficult to change the behavior of selfish people. Even if the price of giving is reduced, a material self-interested person thinks that he or she is still better off not contributing to a public good.

Interestingly, the low matching mechanism has no effect on contributions; the results even show a small decrease in the number of people who contribute to at least one of the funds. Such a reduction in giving would support the view that monetary incentives can have detrimental effects on pro-social behavior. If the normal relative price effect is too small, the motivational crowding effect dominates and pro-social behavior is reduced. Because the result is not statistically significant and very small, the crowding-out effect of limited

donation-matching has to be supported by future studies in order to be conclusive. However, because some sort of intrinsic motivation is a prerequisite for pro-social behavior, the use of monetary incentives in this area can be problematic. The incentives can, on the one hand, be perceived as controlling and therefore either decrease self-determination or interfere with a trust relationship. On the other hand, the external incentives can make it more difficult for a donor to signal his or her generosity and might therefore reduce his or her donation.

(4) *Education*. There is widespread criticism that economics training erodes pro-social behavior. Especially in recent years, as corporate illegal activities have been uncovered, critics held business schools and economics education at least partly responsible for this unethical behavior. More generally, it is widely believed that economics training reduces cooperative behavior. This claim has so far been tested only either by questionnaire studies about attitudes or in laboratory experiments. This thesis presents the first results based on systematic field evidence to analyze whether economic education has a negative effect on pro-social behavior. In general, there are large differences between the students of the different faculties, supporting the view that people are heterogeneous in their pro-social preferences. The results show that economics students behave more selfishly than the average non-economists. However, this behavioral difference is due to a selection effect: selfish persons choose to study economics. To be precise, selfish persons select business administration in particular. It is therefore not true that "economists are an unpleasant lot" (Economist, 1993: 71), but that business economists are. The empirical analysis could not detect an indoctrination effect of economics training on top of the selection effect. These means that academic economists do not *create* the type of selfish persons (the homo oeconomicus) they axiomatically assume in their theories.

The good and the bad news of this thesis have implications for economic theory. The good news that people behave pro-socially is bad news for orthodox economists, who are reluctant to accept that standard economic theory is limited and sometimes purely wrong in predicting behavior. Most models are based on assuming that humans strictly maximize their material self-interest. Although these models are very useful for explaining behavior in a large number of situations, they reach their limits in explaining pro-social behavior. From a broader perspective, however, additional evidence is always good news, no matter whether it supports or rejects a theory. The respective theory can be modified and as a result better explain real-life behavior. Thus, to accept the fact that a large majority of people deviates from the self-

interest hypothesis and sacrifice time and money for the well-being of others is important for economic theory. If pro-social behavior is not taken into account, behavioral predictions may be wrong and one of the most interesting and relevant behavioral phenomena cannot be explained.

The insights from the field evidence have to be incorporated into economics models. While the field experiment about matching donations showed that the relative price effect works at least to explain the variance in pro-social behavior, insights from other social sciences have to be considered to explain the full spectrum of pro-social behavior. The field evidence supports, for example, the importance of framing and social interaction effects on pro-social behavior, but future models should seek to explain the conditions under which these motives become more or less pronounced and which situation triggers a particular behavioral pattern.

The empirical results have policy implications for the fostering of pro-social behavior. Firstly, it is obvious that contributions to public goods are possible without government intervention. It is therefore not necessary for all public goods to be financed by tax money. Moreover, state intervention can act as a substitute for private contributions and therefore produce a classical crowding-out. Moreover, it could be argued that state intervention may even crowd-out intrinsic motivations to pro-social behavior, interfering with self-regulation and resulting in an inferior outcome than without the intervention. The empirical results summarized in the survey part of the thesis show that while public grants to public goods crowd out private contribution, this classical crowding-out is nonetheless far from being complete. Similarly, the empirical part shows that contributions by others are not perceived as a substitute for one's own contributions. On the contrary, contributions by others increase individuals' pro-social behavior. With respect to the motivational crowding-out, evidence for the detrimental effects of state intervention is still rare (exceptions are the very interesting results by Cardenas et al., 2000; Frey and Oberholzer-Gee, 1997). However, if these results were to be supported in further studies, state interventions, even if they are designed to induce Pareto-superior outcomes, would have to be evaluated very critically. If they do not take into account potential motivational crowding-effects, the net effect may be contrary to what was intended.

Secondly, the four main results of the empirical analysis allow speculations about how institutions need to be designed in order to foster pro-social behavior. As discussed above, institutions have to take into account that framing effects are crucially important for pro-social behavior. The procedures have to be perceived as fair to subsequently increase pro-social behavior. Similar to pure framing effects, different default setting have huge behavioral

effects (see the discussion in Thaler and Sunstein, 2003). It may, for example, be crucial in the case of organ donation whether the default setting is donation (barring explicit opposition) or non-donation (barring explicit approval). Although the decision may seem to be same, the default as such, presumably set by law, may contain information about either the appropriateness of donating organs or about the quality or risk of donating one's organs. Of course, defaults may also have huge behavioral effects because people procrastinate changing the default setting or suffer some sort of status-quo bias.

Furthermore, people's behavior is conditional on the behavior of others. Institutions must therefore avoid instigating a low expectation about the behavior of others in order to increase pro-social behavior. People normally underestimate the extent of pro-social behavior in a group. Depending on the public good, this can be corrected, for instance, by either removing signs of anti-social behavior or by announcing the donations of other people or of a leader. Many private fundraisers already use this strategy successfully by informing potential donors about how many others have already donated. In the public sphere, there is still much potential for thinking about how to use social interaction effects to increase pro-social behavior.

The results of the field experiment about matching donations support the notion that monetary incentives work for pro-social behavior. In the discussion about changing the tax system either by cutting tax rates, introducing a flat-rate income tax or switching to a consumption tax, the effects on charitable giving have to be taken into account. Matching donations can be seen as an alternative method of subsidizing charitable giving. However, as discussed already, the incentives provided under such a model have to be perceived as supportive and not controlling.

The results from the analysis of the relation between economics education and pro-social behavior suggest that it is very difficult to destroy (and probably also to induce) pro-social behavior by relying on education. The introduction of more ethics courses in schools may therefore not be a very successful policy for increasing pro-social behavior. It is also not clear whether the information that helping others makes one happy would persuade people to engage more in voluntary work.

It has become clear in this thesis, however, that the economic analysis of pro-social behavior can add insights to a topic that is extremely relevant for the living together of human beings. It is therefore necessary to remain open to the research methods and theoretical approaches of other social sciences. The theoretical predictions gained from such a cooperation of sciences

have to be empirically tested in a stringent way – if possible in field settings. Such research would provide a better understanding of the motivations for pro-social behavior as well as knowledge about how institutions can be designed in order to foster contributions of time and money to public goods.

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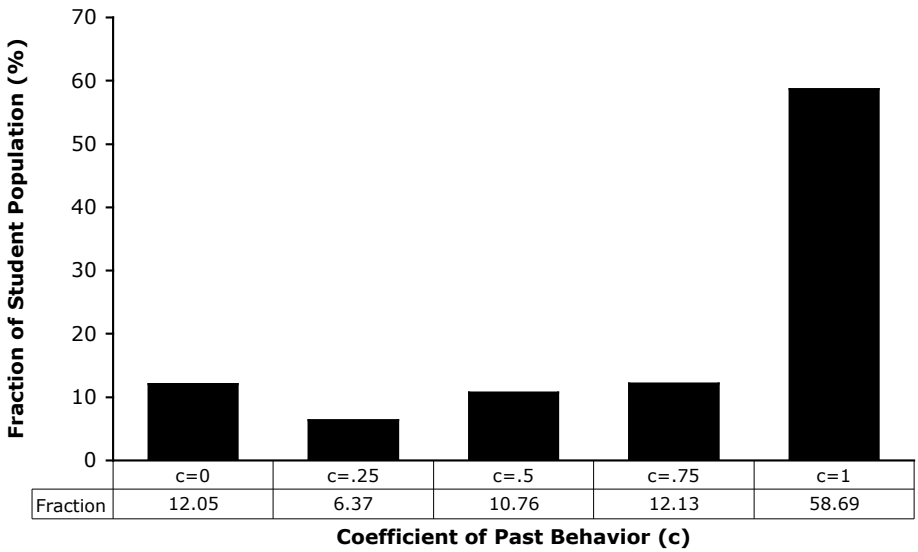
Appendix

Figure App.III.1

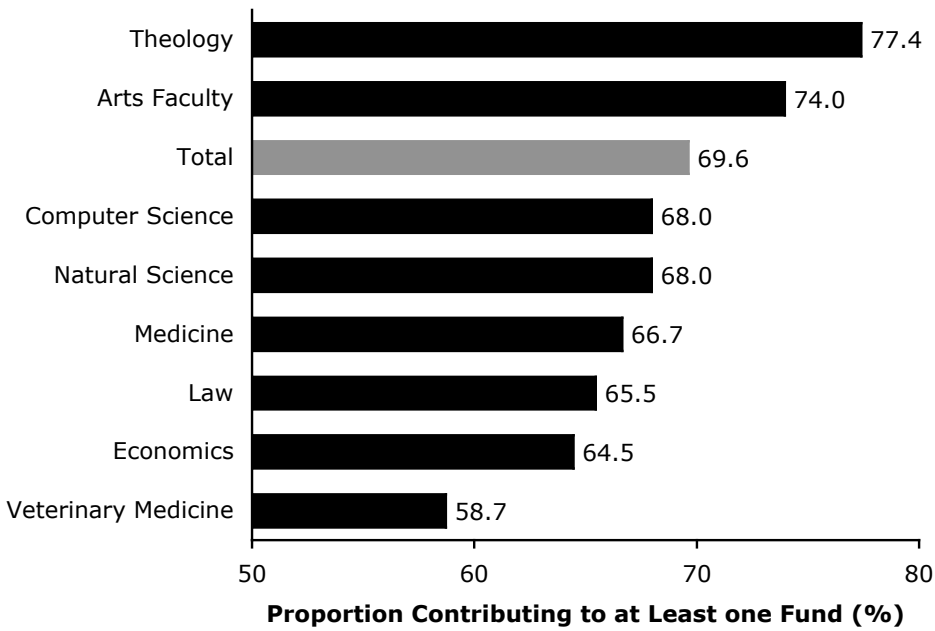
Distribution of 'Types' After Four Decisions



Data Source: University of Zurich, 1998-2002.

Figure App.III.2

Differences Between Disciplines (All Semesters)



Data Source: University of Zurich, 1998-2002.

Figure App.IV.1

Sample Information Sheet of Field Experiment

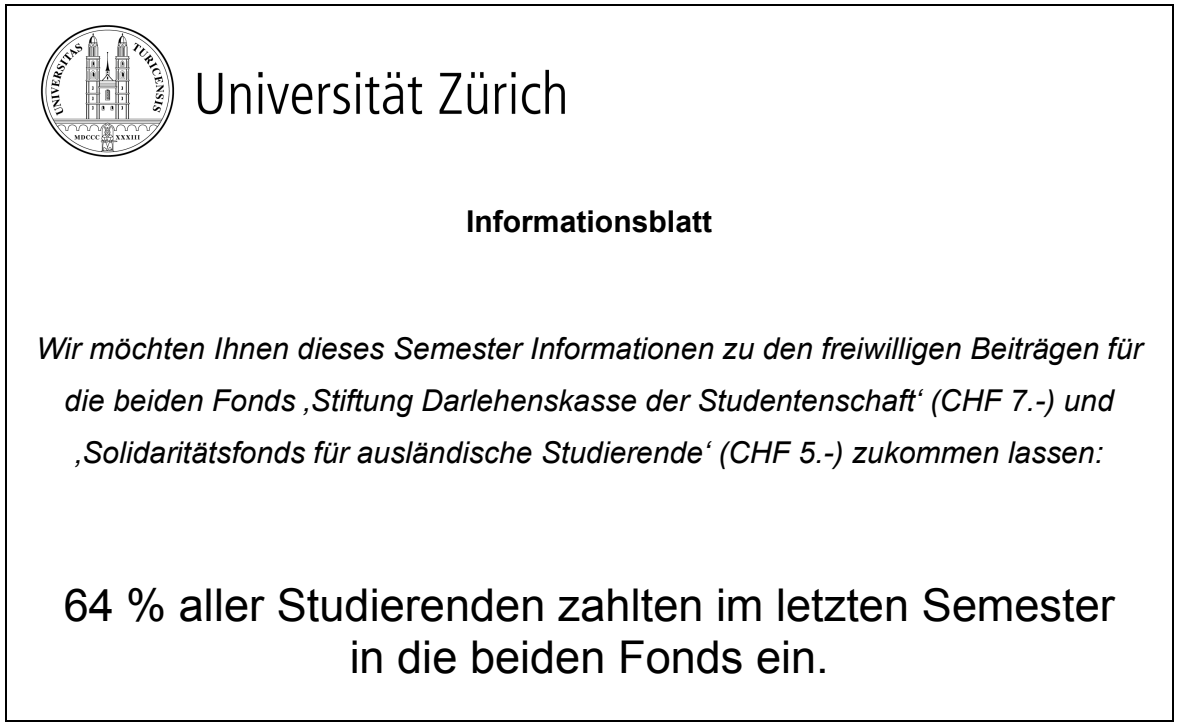


Table App.IV.1

Contributions to Both Funds Conditional on Others' Behavior

Dichotomous dependent variable: Contribution to both fund (=1);
Conditional logit model with individual fixed-effects

Variable	Coefficient (z-value)	P>|z|
Treatment *'High'* (64%)	0.397**	0.001
	(3.21)	
Treatment *'Low'* (46%)	0.11	0.370
	(0.90)	
Individual fixed-effects	Yes	
Semester dummies	Yes	
N	78,232	
Log likelihood	-29550.178	

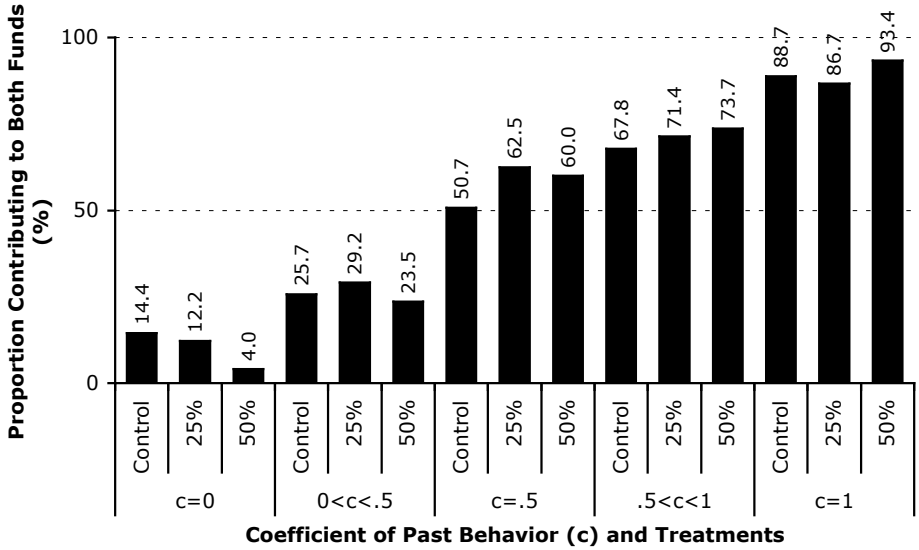
Notes: Test of differences for treatment *'High'* - *'Low'* = 0.0: $\chi^2(1) = 2.82$, $p < 0.0932$

Level of significance: * $0.01<p<0.05$, ** $p<0.01$.

Data source: Field experiment, University of Zurich, 2002/2003.

Figure App.V.1

Contribution Rate to Both Funds Depending on Treatment and Coefficient of Past Behavior



Notes: '25%' refers to treatment 'Matching 25%' while '50%' refers to treatment 'Matching 50%'.
Data source: Field experiment, University of Zurich, winter term 2002/03.

Table App.V.1

Gender Differences and Price of Giving

Dichotomous dependent variable: Contribution to both funds (=1); probit regression

Variable	Coeff. (z-value)	Marginal Effect
Treatment *'Matching 25%'*	-0.059	-2.2%
	(-0.51)	
Treatment *'Matching 50%'*	0.083	3.0%
	(0.72)	
Treatment *'25%'**Gender	0.135	4.8%
	(0.84)	
Treatment *'50%'**Gender	0.099	3.6%
	(0.61)	
Gender (Female=1)	-0.049**	-1.8%
	(-2.14)	
Constant	0.418***	
	(25.23)	
N	13,058	
Log likelihood	-8420.2384	

Notes: A test of joint significance of the two interaction terms is not statistically significant on a conventional level; $\chi^2(2) = 1.05$, $p < 0.5911$.
Level of significance: * $0.05<p<0.1$, ** $0.01<p<0.05$, *** $p<0.01$.
Data source: Field experiment, University of Zurich, winter term 2003/03.

Table App.VI.1

Various Measurements for Economics Training

Dichotomous dependent variable: Contribution to at least one fund (=1)

Variables	I	II	III	IV
	Probit	Cond. logit	Probit	Cond. logit
Economics and Business students	-0.105**		-0.099**	
	(0.017)		(0.013)	
Number of Econ and Bus. semesters	-0.005**	-0.000		
	(0.001)	(0.012)		
Number of Business semesters			-0.011**	-0.007
			(0.001)	(0.009)
Number of Economics semesters			0.005*	-0.017
			(0.002)	(0.022)
Main phase	0.121**	0.234**	0.125**	0.151
	(0.009)	(0.036)	(0.009)	(0.080)
Ph.D. study	0.006	0.145	0.008	0.000
	(0.013)	(0.080)	(0.013)	(0.003)
Pre-university economic knowledge	-0.101		-0.101**	
	(0.008)		(0.008)	
Control variables	Yes	Yes	Yes	Yes
Individual fixed-effects	No	Yes	No	Yes
N	180,225		180,225	74,982
Log likelihood	-108422.16		-108393.66	-27992.06

Notes: Standard errors in parentheses. Control variables are age, gender, nationality and number of semesters. Reference group consists of 'non-economists', 'basic study', 'without pre-university economic knowledge', 'aged below 26', 'male', 'Swiss', 'semester 1998/99'.
Level of significance: * 0.01<p<0.05, ** p<0.01
Data source: University of Zurich, 1998-2002.

Table App.VI.2

Expectations About the Behavior of Others

What percentage of the student population contributes to both funds?(Guess)

	Economics and Business Students		**Other Students**		**t-test of differences**
	Mean	s.d. (N)	Mean	s.d. (N)	t-value (P>t)
Basic study	**69.89%**	19.45 (177)	**69.74%**	18.74 (972)	0.094 (0.46)
Main phase	**64.46%**	19.43% (204)	**66.08%**	19.85 (1337)	1.089 (0.14)
Ph. D. study	**60.40%**	16.70 (25)	**62.45%**	19.88 (282)	0.499 (0.31)
Total	**66.58%**	19.48 (406)	**67.06%**	19.58 (2591)	0.462 (0.32)

Notes: Without the ‚No idea' answers. A respective Wilcoxon-Mann-Whitney test of the difference in the Ph.D. study is also not statistically significant (z=0.693; p<0.488).
Data source: Own survey, University of Zurich, 2000.

Table App.VII.1

The Effect of Volunteering on Life Satisfaction

Dependent variable: Satisfaction with life

	Panel A		Panel B		Panel C	
	Coeff.	t- value	Coeff.	t- value	Coeff.	t- value
Volunteering weekly or monthly	0.055**	3.15	0.086*	2.40	-0.024	-0.68
Household income, ln	0.190**	16.16	0.154**	7.00	0.284**	11.20
No. of household members$^{1/2}$	-0.214**	-8.19	-0.113*	-2.14	-0.288**	-5.66
Age^2/100	-0.010*	-2.25	-0.040**	-5.34	0.0188	1.77
Years of education, ln	-0.294**	-3.38	-0.124	-0.67	-0.359*	-2.06
Single, no partner	Reference group					
Single, with partner	0.196**	6.05	0.127	1.73	0.288**	4.87
Married	0.272**	8.40	0.203**	2.77	0.330**	5.44
Separated, with partner	0.088	0.95	-0.087	-0.38	0.251	1.49
Separated, no partner	-0.259**	-4.64	-0.424**	-3.27	-0.207*	-2.02
Divorced, with partner	0.339**	5.84	0.056	0.39	0.474**	4.65
Divorced, no partner	-0.071	-1.38	-0.010	-0.08	-0.033	-0.36
Widowed, with partner	0.485**	4.07	0.374	1.73	0.237	0.90
Widowed, no partner	-0.174**	-3.21	-0.149	-1.48	-0.280*	-2.28
Spouse abroad	-0.056	-0.54	0.324	1.35	-0.281	-1.11
No children	Reference group					
Children	-0.004	-0.23	-0.025	-0.66	0.098**	2.75
Employed	Reference group					
Self-employed	-0.115**	-3.03	0.043	0.41	-0.241**	-4.04
Some work	-0.172**	-5.85	-0.022	-0.38	-0.319**	-5.19
Non-working	-0.137**	-6.79	-0.007	-0.21	-0.253**	-5.34
Unemployed	-0.727**	-33.30	-0.481**	-9.27	-0.847**	-22.37
Military service	-0.356**	-4.77	-0.271	-1.26	-0.444**	-3.55
Maternity leave	-0.053	-1.19	-0.125	-1.52	-0.219*	-2.11
In education	0.031	0.96	0.063	0.86	0.003	0.04
Retired	-0.062	-1.82	0.104	1.92	-0.349**	-3.58
Western Germany	Reference group					
Eastern Germany	-0.352**	-4.04	0.404	1.60	-0.438**	-2.93
Year dummies	Yes		Yes		Yes	
Individual fixed-effects	Yes		Yes		Yes	
Constant	7.752**	32.09	8.051**	13.94	7.162**	14.92
No. of observations	125,468		27,364		34,632	
No. of individuals	22,016		3817		5745	
F-value	96.32**		21.23**		36.96**	

Note: OLS models with individual fixed-effects. Panel A shows the effect for the full sample. Panel B shows the effect for people in the lowest quartile with respect to the relative importance of extrinsic life goals ('intrinsic sample'). Panel C shows the effect for people in the highest quartile with respect to the relative importance of extrinsic life goals ('extrinsic sample').

Significance levels: * $0.01<p<0.05$, ** $p<0.01$.

Source: German Socio-Economic Panel.

Table App.VII.2

Loss of Volunteer Work: Effect on People Satisfied/Dissatisfied with GDR

Dependent variable: Satisfaction with life

	Sample A; people *satisfied* with GDR		Sample B; people *dissatisfied* with GDR	
	Coefficient	t- value	Coefficient	t- value
Volunteering less than monthly	Reference group			
Volunteering weekly or monthly	0.148	0.86	0.275	1.86
$Age^2/100$	-0.185*	-2.03	0.032	0.33
Years of education, ln	-2.094	-1.02	0.142	0.07
Single, no partner	Reference group			
Single, with partner	-0.403	-0.84	-0.220	-0.54
Married	0.355	0.55	0.460	0.83
Separated, with partner	-0.850	-0.84	0.591	0.36
Separated, no partner	0.354	0.28	0.672	0.66
Divorced, with partner	-0.237	-0.27	-0.003	-0.00
Divorced, no partner	-0.007	-0.01	0.095	0.13
Widowed, with partner	No observation		0.533	0.39
Widowed, no partner	0.483	0.57	-0.664	-0.95
No children	Reference group			
Children	-0.143	-0.60	-0.291	-1.32
Employed	Reference group			
Self-employed	-0.749	-1.94	0.218	0.60
Some work	-0.383	-1.17	-0.483	-1.53
Non-working	-0.283	-1.38	-0.239	-1.33
Unemployed	-0.315	-1.75	-0.900**	-5.73
Military service	-0.649	-0.89	-0.905	-1.08
Maternity leave	-0.030	-0.10	-0.057	-0.19
In education	-0.024	-0.07	0.622	1.56
Retired	-0.139	-0.40	-0.200	-0.52
Constant	15.740**	2.68	4.854	0.82
Year dummy 1990	Reference group			
Year dummy 1992	-0.214	-1.21	-0.378*	-2.16
Individual fixed-effects	Yes		Yes	
No. of observations	2768		3705	
No. of individuals	1391		1860	
F-value	7.52**		6.74**	

Notes: OLS models with individual fixed-effects. People in sample A are 'more or less satisfied with democracy as it exists in the GDR'. People in sample B are 'more or less dissatisfied with democracy as it exists in the GDR'.
Significance levels: * $0.01<p<0.05$, ** $p<0.01$.
Source: German Socio-Economic Panel.

Table App.VII.3

Supply Functions for Volunteer Work, Germany 1985-1999

Dependent variable: Volunteering monthly or weekly (=1), less frequently or never (=0)

	All		Men		Women	
	Marg. effect	z-value	Marg. effect	z-value	Marg. effect	z-value
Work time	-0.001	-1.40	0.002	1.81	-0.003	-4.31**
(Work time)^2/100	0.00007	0.10	-0.003	-2.64**	0.003	2.84**
Work time n.a.	-0.029	-2.65**	0.001	0.06	-0.047	-3.96**
Household income, ln	0.007	2.52*	0.017	3.44**	0.002	0.61
(No. of household members)$^{1/2}$	0.039	6.91**	0.048	5.04**	0.028	4.27**
Male	Reference group					
Female	-0.069	-17.34**				
Age	0.006	8.74**	0.006	4.88**	0.006	7.56**
(Age^2)/100	-0.006	-8.05**	-0.006	-4.56**	-0.006	-6.91**
Years of education, ln	0.126	13.26**	0.119	7.61**	0.132	11.77**
Single, no partner	Reference group					
Single, with partner	-0.042	-6.24**	-0.043	-3.73**	-0.038	-5.32**
Married	-0.009	-1.36	0.010	0.91	-0.026	-3.38**
Separated, with partner	-0.056	-2.82*	-0.074	-2.42*	-0.036	-1.42
Separated, no partner	-0.017	-1.43	0.007	0.32	-0.032	-2.60**
Divorced, with partner	-0.053	-4.79**	-0.051	-2.64**	-0.049	-4.30**
Divorced, no partner	-0.018	-1.70	0.037	1.62	-0.041	-4.20**
Widowed, with partner	-0.057	-2.98**	-0.057	-1.46	-0.053	-2.97**
Widowed, no partner	0.001	0.11	0.014	0.55	-0.016	-1.48
Spouse abroad	-0.005	-0.17	0.009	0.20	-0.028	-0.85
No children	Reference group					
Children	-0.007	-1.63	-0.009	-1.28	-0.009	-1.84
Employed	Reference group					
Self-employed	0.010	1.07	0.012	0.87	0.015	1.26
Some work	0.059	6.09**	0.067	4.14**	0.048	4.18**
Non-working	-0.002	-0.20	-0.014	-1.04	0.001	0.12
Unemployed	-0.040	-5.67**	-0.043	-3.69**	-0.035	-4.27**
Military service	-0.025	-1.70	-0.022	-1.10		
Maternity leave	-0.045	-3.72**	-0.103	-1.10	-0.036	-3.59**
In education	0.036	3.75**	0.031	2.10*	0.037	3.10**
Retired	-0.005	-0.46	-0.005	-0.30	-0.005	-0.43
Western Germany	Reference group					
Eastern Germany	-0.043	-9.70**	-0.044	-5.64**	-0.038	-7.70**
Nationals	Reference group					
EU foreigners	-0.072	-11.61**	-0.104	-10.54**	-0.042	-5.42**
Non-EU foreigners	-0.087	-18.26**	-0.108	-13.79**	-0.070	-11.93**
Year dummies	Yes		Yes		Yes	
No. of observations	125,468		61,142		64,324	
Log Likelihood	-45925.002		-26774.312		-18992.645	

Notes: Probit regression with robust standard errors (clustered for individuals).
Significance levels: * 0.01<p<0.05, ** p<0.01
Source: German Socio-Economic Panel.

Lebenslauf

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